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AUTHOR	ELLIS, JENNY R.
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ABSTRACT

THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE INTERRELATIONSHIPS AMONG METHODS OF SELECTING UNDERACHIEVERS. SUBJECTS WERE WHITE MALE SIXTH GRADES. SEPARATE ANALYSES WERE MADE FOR FOUR SAMPLES: (1) RANDOM SAMPLE OF 100 STUDENTS, (2) SAMPLE OF 50 STUDENTS WITH IQ'S BELOW 90, (3) SAMPLE OF 50 STUDENTS WITH IQ'S FROM 90 THROUGH 110, AND (4) SAMPLE OF 50 STUDENTS WITH IQ'S ABOVE 110. INSTRUMENTS USED WERE THE: (1) LORGE-THORNDIKE INTELLIGENCE TESTS, (2) WECHSLER INTELLIGENCE SCALE FOR CHILDREN, (3) STANFORD ACHIEVEMENT TEST, AND (4) WIDE RANGE ACHIEVEMENT TEST. THE PRIMARY CONCLUSION WAS THAT EVEN WITHIN A SINGLE CLASSIFICATION OF OPERATIONAL DEFINITIONS OF UNDERACHIEVEMENT, SELECTION AS AN UNDERACHIEVER WAS NOT EQUALLY PROBABLE FOR METHODS USING DIFFERENT MEASURES OR CRITERIA TO ESTABLISH ACADEMIC APTITUDE AND ACADEMIC PERFORMANCE. RECOMMENDATIONS WERE: (1) TO EXPLORE INTERRELATIONSHIPS AMONG SELECTED DISCREPANCY METHODS OF SELECTING OVERACHIEVERS, (2) TO DIRECT RESEARCH TO THE ROLE OF GROUP INTELLIGENCE TESTS, (3) TO INVESTIGATE THE VALIDITY OF FACTORS IN FIVE PARTS OF THE JASTAK PROCEDURE, (4) TO INVESTIGATE THE USE OF A MEDIAN SPLIT TO OBTAIN SCORES REPRESENTING NEGATIVE SELF-CONCEPT, AND (5) TO INVESTIGATE MEASURES OF SELF-PERCEPTION AND METHODS OF SELECTING UNDERACHIEVERS. (EK)

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VARIABLES RELATED TO THE IDENTIFICATION OF UNDERACHIEVERS

Jenny R. Ellis

University of North Carolina at Chapel Hill

Chapel Hill, North Carolina

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JENNY R. ELLIS. Variables Related to the Identification of Underachievers. (Under the direction of ROY E. SOMMERFEID.)

The purpose of the present study was to investigate the interrelationships among various methods of selecting underachievers which could be classified within the same category of operational definitions of underachievement. The six objective methods of selecting underachievers and the clinic procedure for selecting underachievers were based on a category of operational definitions called a relative discrepancy split, *i.e.*, the relative discrepancy between some measure of academic aptitude and some measure of academic performance. Because of the possibility that the individual psychological characteristics of both teacher and child may influence scholastic underachievement, additional comparisons were made using two subjective methods of selecting underachievers and two variables frequently associated with underachievement.

The subjects for the study were selected from the entire sixth grade white male population of a large Southern school system. A separate analysis of data was made for each of four samples of students: (a) a random sample of 100 students, (b) a sample of 50 students with IQ's below 90, (c) a sample of 50 students with IQ's from 90 through 110, and (d) a sample of 50 students with IQ's above 110.

Two major treatments were performed on the data. Both treatments were appropriate for use with dichotomized

data. In this study, the following two categories were used: (a) students selected as underachievers by a given method or variable, (b) students not selected as underachievers by a given method or variable.

The Cochran's Test was used to investigate the probability of selection as an underachiever being equally distributed across six objective methods of selecting underachievers, two subjective methods of selecting underachievers, and a five-part clinic procedure for selecting underachievers.

In order to investigate the interrelationships among six objective methods of selecting underachievers, two subjective methods of selecting underachievers, and two variables frequently associated with underachievement, the tetrachoric correlation coefficient was used.

The primary conclusion drawn from the present investigation was that even within a single classification of operational definitions of underachievement, selection as an underachiever is not equally probable for methods using different measures to establish academic aptitude and/or different criteria to establish academic performance.

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CHAPTER I

THE PROBLEM

Introduction to the Problem

Scholastic underachievement is a topic of general interest and concern. Early identification of underachievers is imperative in order to meet the special needs of these children and thus prevent the development of serious educational disadvantages (Raph, Goldberg, & Passow, 1966). Those people who deal with underachievement on a day to day basis must choose a method of identifying underachievers which seems to be the most valid and practical approach for their specific purposes.

Providing for the child whose academic performance is seriously discrepant from his scholastic aptitude has been a special problem for educators. Investigations relating to various aspects of underachievement have been many and diverse with no clear-cut pattern in the nature of the variables studied. Raph *et al.* (1966) note that the popularity of research in the area of underachievement is evidenced by the increasing number of studies reported in the literature. The direction of trends in the educational level at which these studies have been conducted is away from the almost total emphasis on poor academic performance at the college level toward more studies of poor scholastic performance at the high school, junior high school, and elementary school levels. In comparison with the growing body of research on underachievement, however, relatively few studies have been conducted at the elementary school level and still fewer studies have been specifically concerned with the identification of underachieving students.

Various investigators have addressed themselves theoretically and experimentally, with little agreement among them, to the problem of identifying underachievers. Although, in the literature, a degree of concensus has been reached on abstract definitions of underachievement, agreement on a single method of identifying underachievers has not yet been achieved. The following is a generally accepted definition of scholastic underachievement: "An underachiever falls below an aptitude-based expectancy of academic performance [Farquhar & Payne, 1964, p. 874]." Expectancy of academic performance is ordinarily established on the basis of a standardized group or individual intelligence test. Academic performance is ordinarily established by standardized achievement tests or grade point average (Kowitz, 1965).

The methodological problem of selecting underachievers is illustrated by the variety of identification techniques used by different investigators. The reports in the literature which compare methods of identifying underachievers point to the need for further investigation in this area, particularly with respect to the early identification of underachievers. Several authors (Farquhar & Payne, 1964; Kornrich, 1965; Kowitz, 1965; Pippert & Archer, 1963; Shaw, 1961; Thorndike, 1963) have been concerned with the general inconsistency of the findings on underachievement and with the variety of existing operational definitions of underachievement.

In an article on the definition and identification of underachieving students, Shaw (1961) discussed differences among criteria for measuring academic achievement. It was his opinion that underachievers selected by discrepancy between academic aptitude and standardized achievement test results sometimes differ from underachievers selected by discrepancy between academic aptitude and teacher grades. The difference, according to Shaw, tends to occur most frequently among children whose grades indicate marked underachievement, but whose standardized test results do not indicate underachievement. Kowitz's (1965) analysis of underachievement discussed various aspects of judgment which may be reflected in discrepancies between teacher grades and scores on standardized achievement tests. He pointed out that teacher judgment often includes more than the measured achievements of the child. For the most part, teachers have not been trained to make diagnostic judgments on the academic development of the student. Teachers are further handicapped by limited facilities for dealing with students in a professional relationship.

Despite the general methodological disagreement among researchers, however, schools and clinics require procedures and terminology with which to describe their populations. The need for comparing various methods of selecting underachievers is further supported by differences in the availability of various sources of information to the classroom teacher. At the beginning of the school term, the teacher has available to her several sources of information for identifying underachievers: standardized group test data, previous or assigned classroom grades (grade point average), or referral to a psycho-educational clinic for individual evaluation of academic aptitude and academic performance. The method of identifying underachievers most easily available to the classroom teacher utilizes academic aptitude measured by a standardized group intelligence test and academic performance measured by grade point average. Referral to a psycho-educational clinic for individual evaluation of academic aptitude and academic performance usually involves a lapse between referral and assessment which may prevent immediate implementation of educational planning for a given child. Selection of underachievers by standardized group test data has the advantage of being readily available to both clinicians and teachers.

From the literature on underachievement, Farquhar and Payne (1964) classified existing methods of selecting underachievers into four groups of operational definitions and concluded that a wide range of sophistication and complexity exists among methods of selecting underachievers. They enumerated three reasons for a study of the range among methods for the selection and classification of underachievers: (a) The labor required for one technique can be as much as several times that of another; (b) Entirely different groups of individuals may be identified by different selection techniques; and (c) Comparability of studies of over- and underachievement may become meaningless.

The problem with which the present study was concerned was the general inconsistency in the findings on underachievement and the diversity in the literature among methods of selecting underachievers (or, operational definitions of underachievement). The purpose of the present study was to investigate the interrelationships among various methods of selecting underachievers which could all be classified within the same category of operational definitions of underachievement. Because of the possibility that the individual psychological characteristics of both teacher and child may influence scholastic underachievement, two variables frequently associated with underachievement were also included in the investigation.

The following section reviews the literature related to the identification of underachieving students in the elementary grades and selected variables frequently associated with the identification of underachieving students.

Relation of the Present Study to Previous Research

The purpose of the following section is to place the present study in perspective within the vast body of literature on underachievement and to trace the development of concern with the methodological problem of identifying underachieving students. Research related to the present study will be reviewed within the following categories: (a) Studies investigating the identification of underachieving students, and (b) Selected investigations of variables related to the identification of underachieving students.

Studies Investigating the Identification of Underachieving Students

The topic of underachievement has been the target of a wide variety of investigations for over forty years. These studies have been numerous and diverse, subjecting the problem to extensive analysis from many points of view. There appears, however, to be no clear-cut pattern in the nature of the variables studied (Raph *et al*., 1966). Despite the voluminous literature in the general area of underachievement, relatively few studies were found which were devoted specifically to the methodological problems involved in the identification of underachieving students. It is interesting to note, however, that both the earliest and most recent trends in the literature on underachievement are in the direction of the methodological problems of identifying unachievers.

Studies of underachievement conducted in the 1920's and 1930's illustrate the earlier concern with identifying underachievers. These studies are usually associated with the Accomplishment Quotient or the Achievement Quotient (AQ): [Accomplishment Quotient = Educational Age/Mental Age]. Franzen is customarily given credit for first proposing a technique for determining AQ's, although Monroe and Buckingham published a very similar technique in the same year (Eddington, 1966). Although the AQ is utilized to some extent today for the purpose of selecting underachievers, it is considered primarily of historical, rather than practical or operational significance. The AQ has been subjected to much criticism, especially during the 1930's, because of its dependence on a faulty concept of Mental Age and its consequent unreliability (Crane, 1959).

Studies of underachievement conducted in the 1960's have also been concerned with the problem of identifying underachievers. A survey of the literature in the broad area of underachievement found a dual trend in the exploration of some of the methodological problems involved in past studies of underachievement: (a) Recent analyses of the problem of underachievement have been directed toward evaluating and sharpening the concept of underachievement (Dulles, 1962; Kornrich, 1965; Kowitz, 1965; Lavin, 1965; Thorndike, 1963). (b) Studies have begun to appear which classify and compare methods of identifying underachievers (Farquhar & Payne, 1964; Pippert & Archer, 1963; Rowland & Smith, 1966).

The concept of underachievement. Past studies of underachievement reflect general agreement on abstract definitions of underachievement. Most of these definitions have been expressed in terms of discrepancy between actual and expected performance. Diversity among definitions of underachievement has usually occurred at the operational level where individual researchers must decide specifically on measures of aptitude, criteria for measuring achievement, and the magnitude of discrepancy between aptitude and achievement which constitutes underachievement (Kornrich, 1965).

Dulles (1961) stated that the concept of underachievement itself is not complex. Underachievers are simply those students who do not perform in the classroom as well as expected. He suggested that it is the choice of absolute standards by which expectancy and performance are measured which actually determines underachievement. Taking a sociological approach to the problem of underachievement, Dulles stated that by defining lack of learning as underachievement, the student, rather than the predictor, is held responsible for the discrepancy which may occur between performance and prediction. He stressed the need for attention to be directed toward measures of prediction rather than toward the underachievement: "Simply changing the terminology from 'underachieving' to 'over-predicted' would perhaps eliminate some of the value connotations related to the student [p. 122]."

Thorndike's monograph The Concept of Underachievement (1963), represents the first current, systematic effort to examine and clarify the existing construct of underachievement and related methodological problems. In the introduction to his monograph, Thorndike stated that past research has been generally misleading and inconclusive. He attributed the ambiguity of past studies on underachievement, in part, to the vague and faulty concept of underachievement. Thorndike approached the concept of underachievement in terms of the imperfectness of predictions and the need to understand more fully failures to predict more accurately. This approach to underachievement removes from the concept the value connotations to which Dulles (1961) referred.

Thorndike described four sources of discrepancy between academic expectancy and academic performance which influence the effectiveness of predictions of underachievement: (a) errors of measurement, (b) heterogeneity in the criterion variable, (c) relatively unmodifiable factors in the background or environment of the individual, and (d) personal and educational factors subject to manipulation and modification (Thorndike, 1963). Each of these sources of discrepancy between expectancy and performance will be considered separately in the following paragraphs.

A primary source of discrepancy between actual and expected achievement may be attributed to _errors of measurement_. "Errors of measurement" refers to the combination of factors which make it impossible to obtain exactly the same results from two independent measures of the same function. Applied to underachievement (_i.e._, discrepancy between expected and actual performance), measures of expectancy as well as the score or grade which represents performance will each be subject to errors of measurement. Thus, neither the predictor nor the criterion is characterized by perfect accuracy. Thorndike pointed out that discrepancies between these two measures of different functions can occur due to the errors of measurement in each. It is possible that what may appear to be a sizable degree of underachievement may actually be nothing more than the product of errors of measurement (Thorndike, 1963).

Effects of errors of measurement, although until recently unstressed, have nevertheless affected the quality of research in underachievement. Thorndike stated two ways in which errors of measurement affect experimental design.

Firstly, large errors of measurement, especially when the correlation between the predictor and criterion is high, result in discrepancies between expected and actual achievement which may be largely attributable to chance. The low reliability of such discrepancies reduces substantially the sensitivity of studies investigating the correlates of these discrepancies. The "regression effect" is a second example of errors of measurement which affects the discrepancy between expected and actual performance. Whenever the correlation between two measures is less than perfect, and especially when it is low, the individuals who fall well above average on one measure are likely to be less superior on the other. Those who fall well below average on the first measure are likely to be less inferior on the second (Thorndike, 1963).

The regression effect has certain special implications for the identification of underachievers. A group selected on the basis of a high score on an aptitude test will in general do less well on an achievement measure. A group selected on the basis of a low score on an aptitude measure will show a regression upward on an achievement measure. Lavin (1965) illustrated this effect in the following chart. Thus the academic performance of a student with high ability can only be equal to or less than his ability classification; hence, he cannot be an overachiever. The academic performance of a student in the low ability

Observed ability	Observed School Grades		
	LOW	MEDIUM	HIGH
High	Pronounced Underachievement	Underachievement	Performance Equal to Capacity
Medium	Underachievement	Performance Equal to Capacity	Overachievement
Low	Performance Equal to Capacity	Overachievement	Pronounced Overachievement

(Lavin, 1965, p. 27)

group can only be equal to or greater than the ability classification; therefore, he cannot be an underachiever. Underachievers are thus overrepresented in the high ability group and overachievers overrepresented in the low ability group.

A second source of discrepancy between expected and actual achievement may be attributed to heterogeneity in the criterion variable. Evaluation of actual achievement necessitates a criterion measure. Criteria for achievement are usually established in terms of standardized tests of achievement or teacher grades (Kowitz, 1965). "Heterogeneity in the criterion variable" refers to the heterogeneity that is associated in a systematic way with known or knowable facts about the criterion. Such systematic heterogeneity is introduced into the criterion variable whenever data is combined from different school systems, for example.

Thorndike warned that, whatever criterion is used, it is crucial that it be substantially the same for all the cases in the group (Thorndike, 1963).

A third source of discrepancy between expected and actual achievement is the *stable, relatively unmodifiable factors in the nature and background of the individual* which affect his standing on a measure. Sex, race, socio-economic status are examples of these kinds of factors. Thorndike proposed that these factors should be used to make predictions of underachievement which are more informed and accurate (Thorndike, 1963).

The fourth source of discrepancy between expected and actual performance is *personal and educational factors which are subject to manipulation and modification*. When the previously mentioned three sources of discrepancy are controlled, then the factors that can be modified or manipulated represent the main focus of research concern with underachievement and overachievement. Thorndike stated that research within this classification is likely to be correlational (in which the relation of certain modifiable factors to achievement is investigated) or experimental [in which a particular element in a situation is actually modified and the results of the modification observed (Thorndike, 1963)].

Classification and comparison of methods of identifying underachievers. A survey of the literature on underachievement revealed only three studies specifically concerned with the classification and/or comparison of techniques used in selecting underachievers (Farquhar & Payne, 1964; Pippert & Archer, 1963; Rowland & Smith, 1966).

Pippert and Archer (1963) were primarily concerned with the implications of the diversity among criteria for measuring underachievement. The purpose of their study was to determine differences among underachievers selected from the same class by each of two different criteria for selecting underachievers: grade point average and standardized achievement test data. The population chosen for study was a class of 105 boys and 145 girls from a medium sized community high school in northern New England.

A student was considered an underachiever if his grade point average or achievement test score fell below an estimated aptitude-based expectancy. Academic expectancy was established on the basis of scores from the *Otis Quick-Scoring Beta Test of Intelligence*. Academic achievement was established on the basis of grade point average and also performance on the *Iowa Tests of Educational Development* (ITED). Only students scoring above IQ 110 on the *Otis* (46 boys and 80 girls) were included in the study. The investigators arbitrarily established correspondingly higher achievement expectancies on grade point averages and ITED for brighter students. All students included in the study were administered the *Watson-Glaser Critical Thinking Appraisal*, *Kuder Preference Record C*, an adjective checklist, and *Sims*

Occupational Rating Scale. Father's occupation and student's occupational choice were also requested.

The authors concluded that the individuals identified as underachievers by discrepancy between academic aptitude and grade point average tended to have different characteristics from individuals identified as underachievers by discrepancy between academic aptitude and achievement test scores. Only two persons were selected as underachievers by both methods. More boys than girls were selected as underachievers by discrepancy between academic aptitude and grade point average. More girls than boys were identified as underachievers by discrepancy between academic aptitude and achievement test scores. Comparisons between both methods of selecting underachievers indicated that students selected by discrepancy between academic aptitude and grade point average scored higher on the Otis Quick-Scoring Test of Intelligence, Iowa Tests of Educational Development (composite and subscores), and the Watson-Glaser Critical Thinking Appraisal. No differences between students selected as underachievers by each of the two methods were found on the Kuder Preference Record, Sims Occupational Rating Scale, occupation of father, or occupational choice.

On the adjective checklist, those adjectives that were selected by 75% of the respondents were compared. Of the underachievers by grade point average, the boys checked logical, intelligent, and considerate most frequently. The girls checked *argumentative*, *kind*, *sympathetic*, *nervous*, *friendly*, and *responsible*. Of those classified as underachievers by achievement test scores, the boys checked *friendly* and *cheerful* most frequently. The girls checked *active*, *sympathetic*, *alert*, *considerate*, *cheerful*, and *enthusiastic*. Of the achieving students, the boys checked *kind*, *active*, *dependable*, *friendly*, *proud*, *cheerful*, and *realistic*. The girls checked *friendly* and *reliable* (Pippert & Archer, 1963). The study by Pippert and Archer is important because it submitted to systematic study an assumption frequently referred to in the literature (Kowitz, 1965; Shaw, 1961): that selection of underachievers by discrepancy between academic aptitude and teacher grades and selection of underachievers by discrepancy between academic aptitude and achievement test scores sometimes differ in the types and numbers of underachievers identified by each. One problem with the Pippert and Archer study, however, is the arbitrary establishment of expectancies for achievement in both methods. Establishing expectancy on an arbitrary basis renders it impossible to determine whether the cut-off points which are selected for each method are actually comparable.

Rowland and Smith (1966) proposed that the wide differences of opinion regarding the characteristics of underachievers may be due in part to weaknesses of the more common definitions of underachievement. They classified existing definitions of underachievement into three basic types. The examples of these definitions which they employed to test their hypotheses, however, are all based on the uniform criterion of standardized achievement tests. Thus, the types of definitions which follow differ from each other, not on criterion, but with respect to the way in which the discrepancy between an aptitude measure and a performance measure is obtained. The following are the three types of definitions of underachievement classified by Rowland and Smith: Type 1 definition is based on the grade level achievement of the group. An underachiever is an individual whose achievement falls a specified amount below the mean grade level of the group. Type 2 definition is based on the difference between an individual's aptitude score and achievement score in standard deviations. Type 3 definition is based on factors concerning the errors of measurement in testing.

The purpose of the Rowland and Smith study was to test the following hypotheses regarding the kinds of students selected by each definition with respect to intelligence: (1) Type 1 definition identifies the individual of low ability and consequently, the low achiever; (2) Type 2 definition identifies greater numbers of underachievers from the high ability group; and (3) Type 3 definition is less selective toward the high and the low ability groups and tends to select a ratio of underachievers fairly equal to the distribution of the entire sample. The School and

College Ability Test (SCAT) and *Sequential Tests of Educational Progress* (STEP) were administered to 55 fourth grade pupils of a small suburban school district in California. Results from the Reading and Mathematics subtests of STEP were used. The five pupils who had the lowest achievement in each subject according to each of the three definitions were selected for study. Results of the investigation showed that hypotheses 1 and 2 were confirmed. The Type 3 definition based on consideration of errors of measurement did not tend to select greater numbers of underachievers from a particular ability group in Reading; however, in math, the Type 3 definition tended to select students of high ability as underachievers. The investigators reached the following conclusion:

> There appears to be no universal definition for *underachievement* that would identify pupils as underachievers in general. Different definitions select different pupils as underachievers and the same definition selects different pupils in different subjects. Until *achievement* can be universally defined and identified, studies of the characteristics of under- and overachievers must be viewed in the light of the ability group favored by each definition [Rowland & Smith, 1966, p. 107].

A study by Farquhar and Payne (1964) illustrates a more sophisticated approach to the classification and comparison of various techniques of identifying underachievers than the investigation by Rowland and Smith (1966). The study originated from a review of the literature realted to a larger project on motivation. Farquhar and Payne noted conflicting results and a variety of operational definitions of underachievement in the literature. They classified existing techniques of selecting underachievers into four groups of definitions:

> I. Central tendency splits. Under- and overachievement are determined by dichotomizing a distribution of combined aptitude and achievement measures.
>
> II. Arbitrary partitions, middle group eliminated. Discrepancies are determined by contrasting extreme groups in achievement-aptitude distributions, by eliminating a middle group.
>
> III. Relative discrepancy splits. Grade point average and aptitude predictors are ranked independently. Under- and overachievement is determined by the discrepancy between the two ranks.
>
> IV. Regression model selection. A regression equation is used to predict achievement from aptitude measures. Under- and overachievement is then determined on the basis of the discrepancy between predicted and actual achievement [Farquhar & Payne, 1964, pp. 874-876].

The problem of multiple operational definitions of underachievement was explored in the Farquhar and Payne study by applying one or more of the most representative techniques from each classification to a single referent sample and comparing the overlap of various approaches. The population for the study was the 1959 tenth grade class of a single Michigan high school (312 males and 304 females). The investigators developed their own regression approach to meet the requirements of their project on motivation. This regression approach was compared with the representative techniques selected from eight publications to illustrate the wide range of operational definitions used in the identification of underachievers. Two analyses were made. The first analysis was primarily concerned with the total number of individuals selected by each method. The second analysis was primarily concerned with the number of agreements in classification.

Farquhar and Payne concluded that there is an extreme range in the absolute number of individuals selected as underachievers and overachievers depending on the particular technique used. They also noted that for various methods, there is a wide sex difference in the number of individuals selected for a particular achievement classification. With the exception of two regression techniques, there seemed to be little agreement among techniques by which an individual finally is designated an underachiever. Like Rowland and Smith (1966), they concluded that there is a definite need "to adopt standard definitions of the procedure for identifying underachievers [Farquhar & Payne, 1964, p. 883]."

Selected Investigations of Variables Related to the Identification of Underachieving Students

The vastness, diversity, and general inconclusiveness of the literature on underachievement is referred to frequently by investigators concerned with various aspects of underachievement (Lavin, 1965). Raph *et al.* (1966) noted that taken collectively, investigations concerning characteristics of underachievers are so widely varied in their findings, their definitions of underachievement, the instruments employed, and the ages selected for study, that few, if any generalizations can be made about the characteristics of underachievers. A comprehensive review of the entire body of literature on underachievement would thus become a major work in itself and is beyond the limits of the present chapter. Therefore, this section will treat the research related to the present study within the following categories: (a) Selected studies of demographic variables related to underachievement [educational level, intelligence, sex differences], and (b) Selected studies of certain personality variables frequently associated with underachievement [self-concept, student and teacher judgment of achievement].

Educational level. Studies on various aspects of underachievement have most frequently used college populations. A downward trend toward more investigations conducted at the high school and junior high school levels is reflected by the increasing number of investigations which use these populations for study (Raph et al., 1966). Although investigations at the elementary school level have been conducted more frequently in recent years, the relatively small number of studies using populations at this level prevents cogent generalizations or conclusions regarding the characteristics of elementary age underachievers.

There have been a few studies which illustrate the growing concern with early identification of underachievers.

D'Heurle (1959) discovered academic underachievement in a group of gifted third graders. Barrett (1957), in an intensive study of a small number of gifted underachievers, found an underachievement pattern present by grade five. In a study which investigated the relationship of childrens' self-perceptions to academic achievement, Nash (1964) analyzed data from an inventory of 155 self-perception items. He found that the proportion of underachievers in the eighth grade was greater than in the seventh grade. On the self-perception inventory, more items discriminated significantly between underachievers and achievers at the eighth grade level than at the seventh grade level.

Shaw and McCuen (1960) investigated the question of whether there is any specific academic level at which underachievement begins. The sample for the study was chosen from students whose ability was in the top 25% of the school population. These students were classified as achievers or underachievers on the basis of their cumulative grade point averages in grades 9, 10, and 11. A student whose grade point average was below the mean for his class was considered an underachiever. When the higher achieving and lower achieving males were compared, the data showed a significant difference in the grade point averages of the achievers and underachievers beginning at grade three and increasing at each grade level up to grade ten. At grade ten, however, the difference began to decrease although it remained statistically significant.

In summary, there appears to be some agreement that underachievement may become evident before high school and possibly before junior high school; however, more studies are needed of underachievers at the elementary school level to establish the onset of underachievement.

Intelligence. Research relating intelligence and achievement has been conducted at all educational levels. The highest correlations between achievement and intelligence have been reported for the high school level; the college level ranks next, the graduate, lowest. The elementary level has been too infrequently studied to allow meaningful generalizations (Lavin, 1965).

There are several studies of achievement and intelligence at the elementary school level, however, which warrant comment. Barnes (1955) correlated intelligence test scores on the Otis Quick-Scoring Mental Ability Test with scores on the Stanford Achievement Test for students in grades one through four. The correlations ranged from .31 to .63 and showed a tendency to increase from first to second grade. The magnitude remained fairly stable from second to fourth grade, however, Hinkleman (1955) correlated intelligence with teacher grades in various subject areas. He used a group of students for whom data were available for grades two through seven. Correlations were found to be fairly consistent from grades two through seven, averaging around .65.

In a study by Parsley (1964), the question of the relationship of sex differences in achievement to IQ was investigated using a sample from grades four through eight. Parsley found that brighter boys achieved at higher levels than girls at the same intellectual level. Girls who were average or below in intelligence achieved at a higher level than boys at the same intellectual level. Norman (1962) in a study of age, sex, and achievement patterns in gifted children, used as his sample two groups of sixth grade children with IQ's of 130 plus on the California Test of Mental Maturity. These groups were established on the basis of expected achievement on the California Achievement Test. Norman found that achievers had significantly higher language IQ's while non-achievers had significantly higher non-language and total IQ's. Achievers were also much more consistent both in their means on the language and non-language parts of the California Test of Mental Maturity and in their expected achievement profiles on the California Achievement Test.

In a study relating educational achievement with specific levels of intelligence, Holowinsky (1961) tested the hypothesis that all students within the range of dull-normal and average intelligence are equally able to master educational skills. The subjects for the study were male students and female students from 12 to 17 years of age and within the 80-110 IQ range. Ability levels were established in terms of the Otis Quick-Scoring Mental Ability Test. Educational achievement was measured by the California Reading Test and the arithmetic subtest of the Wide Range Achievement Test. In reading achievement, Holonwinsky found significant differences not only between students of dull-normal and high-average ability, but also between students with low-average and high-average ability. In arithmetic achievement, no significant differences were found among IQ levels. Regarding the relationship between reading and arithmetic at various IQ levels, it was found that students of lower intellectual ability, regardless of age, tended to show better achievement in arithmetic than in reading. After 15 or 16 years of age, students of low-average and average intellectual ability showed significantly better achievement in reading than in arithmetic.

Although intelligence has been correlated with various aspects of achievement and underachievement, there do not appear to be any studies which explore specifically, the relationship between various definitions of underachievement and various levels of intelligence. The present study attempted to investigate this relationship by comparing several definitions of underachievement at each of three levels of intelligence.

Sex differences. Two primary reasons are often cited for controlling sex in a study of underachievement. Firstly, the results from a large number of studies have indicated that ability and school performance tend to be less highly correlated for males than for females. Secondly, variables that predict academic performance for males may differ from variables that are predictive for females(Lavin, 1965). The following investigations illustrate some of the findings concerning the relationship of sex differences to various aspects of achievement.

In the previously mentioned study of the onset of academic underachievement, Shaw and McCuen (1960) noted sex differences in the achievement patterns of males and females. Subjects for the study were classified as achievers or underachievers on the basis of their cumulative grade point averages in grades 9, 10, and 11. Grade point averages for the higher achieving males and the lower achieving males were found to be significantly different beginning at the third grade and increasing at each grade level up to grade ten. At grade ten, the difference began to decrease although it remained statistically significant. The achievement pattern of the females, however, was considerably different. Through grade five, those females who were later to become low achievers tended to exceed the higher achievers in grade point average. At grade six, the higher achievers attained a higher grade point average for the first time. Thus, males were identified as underachievers earlier in their school careers. Underachievement for females seemed to become evident at puberty.

The purpose of a study by Clark (1967) was to explore the relationship of middle class sex role expectancies to the differential achievement of males and females. Clark hypothesized that the middle grades of elementary school are a transitional period during which boys close an academic gap between themselves and girls; and the period during which girls learn that they are not supposed to be good in arithmetic. Subjects for the study were the total enrollment of pupils in the fourth, fifth, and sixth grades of a small suburban elementary school in New York state (83 boys and 80 girls). The students were asked to indicate whether they thought they were in the "top" or "bottom" half of their class in reading, spelling, or arithmetic. Results in general suggested that the developmental shift in boys' and girls' grades and perceptions of their standing were consistent with the middle class sex-role expectancies for academic achievement.

In a longitudinal study on the elementary school level, Hughes (1953) found that when ability was controlled, the reading achievement of girls was superior to boys through the fourth grade. Beyond the fourth grade, however, sex differences were not significant and did not consistently favor the girls. Parsley (1964) investigated the possible presence of sex differences in achievement as related to IQ.

The group selected for study was the fourth through eighth grade of a small urban school district, primarily middle socio-economic status. On the basis of the California Test of Mental Maturity, the population was divided by sex into five IQ groups: 75-94, 95-104, 105-114, 115-124, and 125 plus. On the basis of the California Achievement Tests (Reading Comprehension, Reading Vocabulary, Arithmetic Reasoning, and Arithmetic Fundamentals), the population was classified, within each IQ subgroup, as under-, average-, or overachievers. The findings, in general, tended to support earlier studies of sex differences in various aspects of achievement. Females excelled in reading achievement. Males excelled in arithmetic reasoning, but not in arithmetic fundamentals.

Nash (1964), using students in the seventh and eighth grades, found that items in a self-perception inventory which distinguished between achievers and underachievers were widely different for each sex. Phillips (1962) investigated social class, sex, and anxiety as interrelated factors in school achievement. Using a sample of 759 seventh grade students, he found that there were sex differences in the interrelationships of sex, social class, and anxiety.

It would seem that sufficient studies of elementary and junior high school age students support a relationship between sex differences and various aspects of achievement to warrant controlling for sex differences in the present study.

Self-concept. Historically, the behavioral sciences have devoted considerable attention to the concept of the self (Lavin, 1965). The most commonly accepted definition of the self is frequently attributed to Rogers: the self is "that organized, consistent, conceptual Gestalt composed of the characteristics of the 'I' or 'me' and the perceptions of the relationships of the 'I' or 'me' to others and to various aspects of life together with the values attached to these perceptions [Rogers, 1959, p. 200]." In recent years, some research exploring the relation of academic achievement to self-concept has begun to accumulate. The most noticeable trend in these studies is the concern with the positive or negative aspects of the self-concept. There is wide variation, however, in the terms employed to describe and the measures utilized to assess self-concept. Some of the terms most frequently used in association with the self-concept are: self-ideal, self-image, self-acceptance, self-insight, self-esteem, and self-confidence. Some measures used to assess self-concept include Q-Sorts, adjective checklists, adjective rating scales, checklists or personality trait names, sentence completion techniques, and self-rating scales.

The studies which follow, for the most part, show a relationship between self-concept and academic achievement which is more pronounced for boys than for girls. They also illustrate the spectrum of operational definitions used to assess self-concept and academic achievement. Hence, generalizations from these studies are restricted.

Bruck and Bodwin (1963) investigated age differences in the relationship between self-concept and academic achievement. Subjects for the study were 300 students from the third, sixth, and eleventh grades. The Self-Concept Scale--Draw a Person was used for assessing self-concept. Grade point average was used as a criterion for achievement. A positive and significant relationship was found between self-concept and grade point average at all age levels.

McCallon (1967) investigated the relationship between self scores and ideal-self scores in high, median, and low self-ideal (S-I) groups. Additional variables investigated were sex and academic achievement. The subjects for the study were 1,135 fifth grade students and sixth grade students. Three groups were delineated on the basis of a 22 item self-ideal self rating scale: high S-I discrepancy, median S-I discrepancy, and low S-I discrepancy. Achievement was measured for these students by the Stanford Achievement Test. McCallon found that a significantly large number of males were in the high S-I group while the median group was characterized by a greater number of females. Fifth and sixth grade students did not differ with respect to congruency of S-I perception. The data regarding the possibility of a nonlinear relationship between S-I and academic achievement were inconclusive.

The relationship of self-concept to sex differences in academic achievement has been investigated by several authors. Shaw, Edson, and Bell (1960) and Shaw and Grubb (1958), using the Sarkin Adjective Checklist to measure self-concept, compared a group of underachieving high school males and females with a group of achieving high school males and females. In general, the findings from these studies showed that for boys, a higher achievement level was related to a more positive self-image. For girls, however, a higher level of achievement was not related to a more positive self-image. A study by Fink (1962) explored the relationship between self-concept and academic achievement. Subjects for the study were selected from the ninth grade class of a California high school. Students whose IQ fell within the 90-110 IQ range on the California Test of Mental Maturity were ranked by grade point average. Pairs of achievers and underachievers were formed and matched for sex and IQ (20 pairs of boys and 24 pairs of girls). Information from each student was obtained on autobiographical data, personality inventories, and projective tests. These psychological data, with no information about academic achievement, were given to three psychologist judges who were asked to rate the child's self-concept as "inadequate" or "adequate." The relationship between self-concept and academic achievement was clearly supported for boys, but not for girls. For the boys, those rated as having an "inadequate" self-concept by the psychologists tended to be underachievers; those rated as "adequate" by the psychologists tended to be achievers. Clark (1967) asked 83 males and 80 females enrolled in the fourth, fifth, and sixth grades of a small urban elementary school to indicate whether they believed they were in the "top" or "bottom" half of their classes in reading, spelling and arithmetic. In reading and spelling, a greater self-favorability was found among girls than among boys. However, these differences were not significant.

Some investigators have explored the relationship of academic achievement to academic self-concept. Campbell (1966) examined the relationship between self-concept and school achievement for fourth, fifth, and sixth grade students in a suburban elementary school. Measures of academic ability, academic achievement, and self-concept were obtained from the _SRA Test of Primary Mental Abilities_, the _Iowa Test of Basic Skills_, and the _Coopersmith Self-Esteem Inventory_, respectively. Campbell found that self-concept and academic achievement were related for the total group of fourth, fifth, and sixth grade students and that this relationship was more pronounced for boys than for girls. The levels of self-concept specific to the school setting were found to be related to academic achievement. In a study which investigated the relationship of various self-perceptions of achievement in seventh and eighth grade students, Nash (1964) reported that the major and most consistent theme related to the achievement patterns of the students selected for study reflects attitudes which are directly related to school tasks, such as the following: "My grades are good; I am accurate in my schoolwork."

The studies cited above do not exhaust the literature relating self-concept to academic achivement. Very few studies were found, however, which investigated this relationship at the elementary school level. A survey of the literature revealed no studies specifically concerned with exploring the relationship between self-concept and various operational definitions of underachievement with reference to various levels of intelligence. The present study therefore compared favorability of self-concept with several methods of identifying underachievers at each of three levels of intelligence.

Teacher and student judgment of achievement. Grades are frequently taken to be a manifestation of teacher opinion or to reflect teacher judgment. Several authors (Kornrich, 1965; Kowitz, 1965; Shaw, 1961) have discussed the role that teacher opinion or expectations play in grading practices. There are several studies which attempt to explore some of the variables that make up teacher opinion. Battle (1957) investigated the relationship of school grades and the degree of congruency in teacher-student value patterns in a high school population. He found that students whose value patterns were closer to the teachers', tended to have higher grades than those whose value patterns differed greatly from the teachers'. Some of the value dimensions which proved to be related to school performance were not relevant to school such as economic, political, or religious values. Baker and Doyle (1959) studied the effects of increasing teachers' knowledge about elementary school pupils on their grading behavior. They found that as teachers were provided with more information on students, the correlation between ability and pupil grades decreased. It is possible that increased awareness of individual differences may have led to more diverse criteria for teacher grading.

The purpose of a study by Mattick (1963) was to compare teacher judgment with standardized test results for effectiveness in predicting first grade success for kindergarten age children. The subjects for the study were 972 kindergarten children in a suburban school district. Prior to the administration of any standardized tests, teachers were asked to rate the children in their classes as having high, average, or low potential for success in the first grade. The tests administered for the study were the _Metropolitan Readiness Tests_, _California Short Form Test of Mental Maturity_, the _Lee Clark Reading Readiness Tests_, and the

Lorge-Thorndike Intelligence Tests. The following year, the first grade pupils were rated by their teachers as being high, average, or low achievers in their class. The following correlations were obtained between kindergarten teachers' ratings and the four tests: Metropolitan Readiness Tests .546; Lee Clark Reading Readiness Tests, .448; Lorge-Thorndike Intelligence Tests, .378; and California Test of Mental Maturity, .378. Correlations obtained between first grade teachers' ratings and the four tests were: Metropolitan Readiness Tests, .559; kindergarten teachers' predictions, 429; California Test of Mental Maturity, .371; and Lee Clark Reading Readiness Test, .370. All four coefficients were significant beyond .01 in both groups of teachers. It is interesting to note that the correlation between scores on the Metropolitan Readiness Test and first grade teachers' ratings of achievement is greater than the correlation between kindergarten teachers' ratings and first grade teachers' ratings.

Some investigators have been concerned with the student's perception of his teacher and its effect on academic achievement. Davidson and Lang (1960) studied the relation between children's perceptions of their teachers' feelings toward them and self-perception, academic achievement, and classroom behavior. The measure used to evaluate self- and other-perceptions was a checklist of trait names consisting of thirty-five items. This checklist was administered to 89 boys and 114 girls in grades four, five, and six in a New York public school. It was found that the children's perceptions of their teachers' feelings toward them correlated positively and significantly with self-perception; *i.e.*, teacher ratings of the children's academic achievement and classroom behavior was positively related to the children's perceptions of their teachers' feelings toward them. Social class position was found to be positively related to achievement in school. Children in the upper and middle social class groups tended to perceive their teachers' feelings toward them more favorably than the children in the lower social class group. Also girls tended to perceive their teachers more favorably than boys.

In a study designed to measure various student perceptions of school, Malpass (1953) administered a series of tests to eighth grade students. Teachers, classmates, discipline, achievement, and school in general were rated for favorability on a five-point scale. Correlations between student perceptions and achievement were computed for two criteria of achievement (grades and achievement test scores). In general, Malpass found that favorable perceptions in the school areas, particularly those regarding teachers and achievement, were more highly related to grades than to achievement tests.

Malpass's study in particular suggests the need for further investigation of the relationship of student perceptions of achievement and various criteria for measuring academic achievement. The present study compared student perception of achievement with teacher judgment of achievement as well as with several other criteria for measuring achievement.

Statement of the Problem

The problem with which the present investigation was concerned was the general inconsistency of the findings in the literature on underachievement and the diversity among methods of selecting underachievers (or, operational definitions of underachievement).

The purpose of the present study was to investigate the interrelationships among various methods of selecting underachievers which could be classified within the same category of operational definitions of underachievement. Thus, the six objective methods of selecting underachievers and the clinic procedure for selecting underachievers used in the present investigation were based on a category of operational definitions called, in the Farquhar and Payne (1964) classification of definitions, "relative discrepancy split," *i.e.*, the relative discrepancy in standard score units between some measure of academic aptitude and some measure of academic performance. Because of the possibility that the individual psychological characteristics of both teacher and child may influence scholastic underachievement, additional comparisons were made using two subjective methods of selecting underachievers and two variables frequently associated with underachievement.

Methods 1 through 6, which used the discrepancy between academic aptitude and standardized achievement test data or teacher grades as the criterion for underachievement, were considered objective methods of selecting underachievers. Methods 7 and 8, which used the discrepancy between academic aptitude and teacher judgment or student judgment of achievement as a criterion for underachievement were considered subjective methods of selecting underachievers. Method 9, which was composed of five separate parts, was a clinic procedure for selecting underachievers. Variables A and B were considered measures of self-perception.

The specific methods of selecting underachievers and the variables chosen for study were as follows: (a) Method 1: Selection of underachievers by discrepancy between a standardized group measure of academic aptitude and a standardized group measure of academic performance, (b) Method 2: Selection of underachievers by discrepancy between a standardized individual measure of academic aptitude and a standardized group measure of academic performance, (c) Method 3: Selection of underachievers by discrepancy between a standardized individual measure of academic aptitude and a standardized individual measure of academic performance, (d) Method 4: Selection of underachievers by discrepancy between a standardized *group* measure of academic aptitude and a standardized *individual* measure of academic performance, (e) *Method 5*: Selection of underachievers by discrepancy between a standardized *group* measure of academic aptitude and *teacher grades*, (f) *Method 6*: Selection of underachievers by discrepancy between a standardized *individual* measure of academic aptitude and *teacher grades*, (g) *Method 7*: Selection of underachievers by *student judgment of achievement*, (h) *Method 8*: Slection of underachievers by *teacher judgment of achievement*, (i) *Method 9*: Selection of underachievers by a *clinic procedure*, (j) *Variable A*: Student academic self-concept, and (k) *Variable B*: Student perception of control over environment.

A sixth grade population was chosen for this study because of the generally acknowledged instability of achievement in younger children and because of the need for studies of academic achievement at the elementary school level (Lavin, 1965). Surveys of available research (Lavin, 1965; Raph *et al*., 1966) pointed out sex and race difference in the dynamics of underachievement; therefore, this study used data concerning males of a single race.

Since it is possible that level of intelligence may influence comparisons among methods of selecting underachievers, four samples of white sixth grade males were chosen for this study: (a) random sample of 100 students, (b) sample of 50 students with IQ's below 90, (c) sample of

50 students with IQ's from 90 through 110, and (d) sample of 50 students with IQ's above 110.

The following specific questions were asked for each of the four samples:

1. Is the probability of selection as an underachiever equally distributed across six objective methods of selecting underachievers, two subjective methods of selecting underachievers, and a five-part clinic procedure for selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

2. What are the interrelationships among the six objective methods of selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

3. What is the relationship between the two subjective methods of selecting underachievers?

4. What are the interrelationships among the two subjective methods of selecting underachievers and the six objective methods of selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

5. What are the interrelationships among the five parts of the clinic procedure for selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

6. What are the interrelationships among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, for each of three levels of discrepancy between academic aptitude and academic performance?

7. What are the interrelationships among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

8. What is the relationship between the two measures of self-perception?

9. What are the interrelationships among the two measures of self-perception and the six objective methods of selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

10. What are the interrelationships among the two measures of self-perception and the two subjective methods of selecting underachievers?

11. What are the interrelationships among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, at each of three levels of discrepancy between measures of academic aptitude and academic performance?

The following chapter describes the sample selected for study, the instrumentation employed, the procedure for collecting the data, methods of selecting underachievers, and treatment of the data.

CHAPTER II

SUBJECTS, INSTRUMENTATION, PROCEDURE, DEFINITIONS, AND TREATMENT OF DATA

The purpose of this study was to investigate the interrelationships among six objective methods of selecting underachievers, two subjective methods of selecting underachievers, a five-part clinic procedure for selecting underachievers, and two variables frequently associated with underachievement. The present chapter describes the samples selected for study, the instrumentation employed, the procedure for collecting the data, methods for defining underachievement, and treatment of the data.

Subjects

The samples for this study were selected from the entire white male sixth grade population of a large southern school system. A sixth grade population was chosen because of the generally acknowledged instability of achievement in younger children and because of the need for studies of academic achievement at the elementary school level (Lavin, 1965; Raph _et al_., 1966). Available research points out sex differences and race differences in the dynamics of underachievement; therefore, this study used data concerning males of a single race.

Since it is possible that level of intelligence may influence comparisons among methods of selecting under-achievers, a separate analysis was made for each of four samples of sixth grade males: (a) Analysis I: random sample of 100 students, (b) Analysis II: sample of 50 students with IQ's below 90 (c) Analysis III: sample of 50 students with IQ's from 90 through 110, and (d) Analysis IV: sample of 50 students with IQ's above 110.

The sample of 100 sixth grade males was selected for Analysis I in the following manner: A list of the entire sixth grade population of the school system was obtained from the system's data processing department. A random sample of 100 male students was drawn from the list. A reserve sample of approximately 30 students was randomly selected in case of the inaccessability of students initially selected. This sample of 100 students constituted one of four groups used for study.

The three samples of 50 subjects each were formed for Analyses II through IV in the following manner: Each of the above mentioned 100 randomly selected students was administered the _Wechsler Intelligence Scale for Children_ (WISC) as part of a test battery for the study and was classified by WISC Full Scale IQ into one of three levels of intelligence: IQ's 89 and below, 90-110, 111 and above. An additional list, which classified the entire sixth grade population into the above three levels of intelligence on the basis of Lorge-Thorndike Intelligence Test scores, was obtained from the data processing department. A random sample of approximately 50 students was drawn from each of these three Lorge-Thorndike IQ classifications. The WISC was then administered to each of the students in the three groups classified according to Lorge-Thorndike IQ. On the basis of the WISC Full Scale IQ which was obtained, each student was then assigned to one of the three WISC IQ classifications, to which the random sample of 100 had already been assigned, until each group contained 50 students. Thus, three groups of 50 subjects each were formed for the three levels of intelligence, using students from the original random sample of 100 students plus the additional students selected in the manner just described.

Instrumentation

This section describes the instruments employed to obtain the data for the study. Special attention is devoted to the reliability of these measures since the consistency and the stability of the results from an instrument are considered fundamental requirements for its utility. Reliability coefficients are frequently determined by the split-half method or the alternate forms method. The former addresses the comparability of items in the two halves of the test and thus provides a measure of equivalence. The latter provides a means of assessing the stability of test results over a period of time, if the two forms are not administered in immediate succession.

Standardized instruments used to establish academic aptitude were the Lorge-Thorndike Intelligence Test[1] and the Wechsler Intelligence Scale for Children.[2] Standardized measures of academic performance used were the Stanford Achievement Test[3] and the Wide Range Achievement Test.[4]

In addition to the standardized measures of academic aptitude and academic performance, several unstandardized measures were employed to assess the two subjective methods of selecting underachievers and the two measures of self-perception.

Measures of Academic Aptitude

Lorge-Thorndike Intelligence Tests. The Lorge-Thorndike Intelligence Test is considered a generally acceptable group test of intelligence. Reviews by Freeman (1959),

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[1] I. Lorge, R. L. Thorndike, and E. Hagen, The Lorge-Thorndike Intelligence Tests (New York: Houghton Mifflin, 1964).

[2] D. Wechsler, Wechsler Intelligence Scale for Children (New York: Psychological Corporation, 1948).

[3] T. L. Kelley, R. Madden, E. F. Gardner, and H. C. Rudman, Stanford Achievement Test (New York: Harcourt, Brace, and World, 1966).

[4] J. F. Jastak and S. R. Jastak, The Wide Range Achievement Test (Wilmington, Delaware: Guidance Associates, 1965).

Millholland (1959), and Pidgeon (1959) all classify it among the best of available group tests of intelligence (Buros, 1959). Anastasi (1961) chooses the Lorge-Thorndike Intelligence Test, Level 3 as an illustration of group intelligence tests for elementary age children.

According to the authors of the test (Lorge et al., 1964), the Lorge-Thorndike Intelligence Tests are a measure of abstract intelligence designed to assess "the ability to work with ideas and the relationship among ideas [p. 4]." The Lorge-Thorndike Intelligence Tests are available at five educational levels. Level 3, for grades 4-6, is appropriate to the sample selected for the present study. The test, at this level, is divided into two sections: Verbal and Non-verbal. The subtests comprising the Verbal section are Sentence Completion, Verbal Classification, Arithmetic Reasoning, and Vocabulary. Non-verbal subtests include Figure Classification, Number Series, Figure Analogies. The standardization of the Lorge-Thorndike Intelligence Tests is considered one of its major strengths (Freeman, 1959). The complete battery was standardized by testing 136,000 children in 44 communities in 22 states. The communities were selected on the basis of a composite of factors found to be associated with the measured intelligence of children in the community.

Anastasi (1961) considered the high reliability of Lorge-Thorndike IQ's to be one of its chief sources of strength. Other reviewers of the test (Freeman, 1959; Millholland, 1959; Pidgeon, 1959) also endorse its reliability as being satisfactory (Buros, 1959). Reliabilities were estimated by alternate forms and also odd-even correlations. For Level 3, alternate forms coefficients, obtained from data on 724 fifth grade students, were .896 for the Verbal section and .814 for the Non-verbal section. Odd-even reliability coefficients were reported as .940 for both Verbal and Non-verbal parts of the test (Anastasi, 1961). The standard error of measurement for Level 3 is about four IQ points for the Verbal section and about six IQ points for the Non-verbal section (Anastasi, 1961). Freeman (1959) cautioned, however, that the seemingly satisfactory standard errors of measurement were determined upon only a "moderate number of cases" and recommended that the standard error of measurement should be considered as a tentative estimate only.

Wechsler Intelligence Scale for Children (WISC). The WISC is generally accepted as one of the most adequate of individual measures of general intelligence for children. Anastasi (1961) and Cronbach (1961) concurred that the reliabilities of the WISC are sufficiently adequate for the usual testing purposes. Split-half reliabilities were reported for the WISC which were computed from samples of 200 cases in each of three age groups: 7 1/2, 10 1/2, and 13 1/2 years of age. Verbal Scale reliability coefficients were .88, .96, and .96 respectively. Performance Scale reliability coefficients were .92, .95, and .94, respectively (Anastasi, 1961).

Measures of Academic Achievement

Stanford Achievement Test. Bryan (1965) and Stake and Hastings (1965) considered the 1964 edition of the Stanford Achievement Test to be a reputable instrument for evaluating achievement (Buros, 1965). The level of the Stanford Achievement Test appropriate to the sample selected for this study is Intermediate II for grade six which is composed of the following subtests: Word Meaning, Paragraph Meaning, Spelling, Language, Arithmetic Applications, Social Studies, and Science. Reliabilities for the Stanford Achievement Test were reported as split-half coefficients corrected by the Spearman-Brown formula and the Kuder-Richardson formula #20 estimates. The sample for these estimates consisted of 1,000 cases drawn randomly from 76 school systems. The median split-half reliability coefficients for the Stanford Achievement Test was .90. The coefficients ranged from .85 for the Arithmetic Concepts subtest to .95 for the Language subtest. The median coefficient for the Kuder-Richardson #20 estimates was .90. By this method, the coefficients ranged from .87 for the Arithmetic Comprehension and Arithmetic Concepts subtests to .93 for the Language subtest. Stake and Hastings (1965) concluded that the split-half and

Kuder-Richardson #20 coefficients were generally as high as those reported for any of the other currently available standardized tests.

Wide Range Achievement Test. The 1965 revision of the Wide Range Achievement Test is composed of three subtests (Arithmetic, Spelling, and Reading) each of which is divided into two levels. Level I is considered appropriate for use with children between the ages of 5 years-0 months and 11 years-11 months. Level II is designed for use with persons from 12 years-0 months to adulthood. Because of the recency of the latest revision of the Wide Range Achievement Test, reviews of the test are not readily available.

The manual of the Wide Range Achievement Test reported only split-half correlation coefficients for each age group and the two test levels. These data were obtained from samples of 200 individuals "selected in such a way as to represent probability distributions of achievement based on normative data [p. 13]." The age group most likely to be represented in the present study are ages 10, 11, 12, and 13. Split-half reliabilities for these age groups on the Reading subtest were .990, .982, .986, and .987, respectively. On the Spelling subtest, the reliabilities reported for the above age groups were .981, .982, .972, and .982, respectively. Split-half reliabilities for the same age groups on the Arithmetic subtest were .948, .945, .940, and .947, respectively. For all three subtests at all age levels, standard errors of measurement were reported that were less than two points. If procedures for determining the above reliabilities were acceptable, the coefficients reported would be considered adequate; however, the procedures cited in the manual for the Wide Range Achievement Test were not detailed enough to permit such evaluation.

Unstandardized Measures

Student Self-Concept. Self-concept is assessed by various methods one of which is a Q-Sort. In the present study, self-concept was assessed by Bennett's Self-Concept Q-Sort[5] which is designed for use with elementary age children . The statements which comprise the Self-Concept Q-Sort refer to the self-concept of the child in the school setting. The statements describe behaviors which are specifically identified as relating to positive or negative self-concept. The Self-Concept Q-Sort originally consisted of two forms, each with 26 statements. These two forms were administered to 32 sixth grade students. The rank order correlations between the two forms was .86. Item analyses indicated that only four pairs of items scored at a consistency of less than 90%. Form 2 was selected for publication and appears in Appendix A. Bennett (1964) reported a .34 correlation between the Self-Concept Q-Sort and Iowa Tests of Basic Skills (which is significant beyond the .01 level of confidence). A correlation of .25 (significant beyond the .01 level of confidence) was found between the Self-Concept Q-Sort scores and IQ scores from the Lorge-Thorndike Intelligence Test and the California Test of Mental Maturity. Bennett stated that the statements which comprise the Self-Concept Q-Sort were adapted so as not to exceed the third grade level in reading difficulty. It was necessary to use an unstandardized instrument like Bennett's Self-Concept Q-Sort to assess self-concept for this study because of the scarcity of research instruments available at the elementary school level.

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[5] V. D. C. Bennett, "Development of a Self-Concept Q-Sort for Use with Elementary Age School Children," Journal of School Psychology, III (1964), 19-25.

Student self-perception of achievement. Subjects were asked to rate their scholastic achievement in response to the following question: "How does your present school achievement compare with the way you think you could be doing? (a) Better than expected, (b) As well as expected, (c) Not as well as expected, (d) Much worse than expected."

Student perception of control over environment. Students were asked to respond to the following question: "People like me don't have much of a chance in life. (a)

Agree, (b) Disagree, (c) Not sure."[6]

Teacher judgment of achievement. Teachers were asked to respond to the following question: "How does this student's present scholastic achievement compare with his academic potential? (a) Better than expected, (b) As well as expected, (c) Not as well as expected, (d) Much worse than expected."

Procedure for Collection of the Data

The following section describes the manner in which the data for the study were obtained. The Lorge-Thorndike Intelligence Test, Level 3 and the Stanford Achievement Test, Intermediate II were administered in the fall of 1967 to all sixth grade students as part of the regular evaluation program in the school system chosen for study. Scores on both these instruments were obtained for each of the 150 students selected for the study.

Scores on the Lorge-Thorndike Intelligence Test are reported separately for the Verbal and the Non-verbal portions of the test in terms of deviation IQ's, grade percentiles, grade equivalents, and age equivalents. Cronbach (1961) reported that intercorrelations of both Verbal and

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[6] J. S. Coleman, Equality of Educational Opportunity (Washington, D.C.: U.S. Department of Health, Education, and Welfare, Office of Education, 1966), p. 202.

Non-verbal parts of the test range from .66 to .68. He therefore concluded that differences between the Verbal and Non-verbal scores would not be significant for the majority of pupils. The Lorge-Thorndike IQ utilized in the present study was the mean of the Verbal and Non-verbal grade equivalent scores.

Scores on the Stanford Achievement Test are reported separately for each of the nine subtests. Norms are reported in percentile ranks, stanines, grade scores, and grade equivalents. The technical manual for the Stanford Achievement Test (1966) suggested that the median of these subtests be used if a total achievement score is desired. For the purposes of this study, the median grade equivalent of a subject's Stanford Achievement Test subtest scores was used to represent his total achievement on the Stanford Achievement Test.

In addition to the tests mentioned above, each student selected for study was administered a test battery which included the Wechsler Intelligence Scale for Children, Wide Range Achievement Test, Self-Concept Q-Sort, a question relating to student self-perception of achievement, and a question relating to student perception of control over environment. On the Wechsler Intelligence Scale for Children, the Full Scale Quotient was used as a measure of general intellectual functioning. The Wide Range Achievement Test yields separate subtest scores for Reading, Spelling, and Arithmetic. For the purposes of this study, the mean of the three subtests was used to represent total achievement on the Wide Range Achievement Test.

Scores on the Self-Concept Q-Sort theoretically could range from plus 50 to minus 50. Bennett[7] recommended the use of a median split on the distribution under study to determine positive or negative self-concept.

Midterm grades in the following subjects were obtained and averaged for each student: Reading, Language, Spelling, Writing, Geography, History, Health, Science, and Arithmetic. Midway through the school year, each student's teacher was asked for his judgment regarding the relationship between the academic expectancy of the pupil and his academic performance.

These data, described in the preceding paragraphs were used to select underachievers by each of the methods discussed in the next section. A separate analysis of data was made for each of four samples: (a) Analysis I: random sample of 100 students, (b) Analysis II: sample of 50 students with IQ's below 90. (c) Analysis III: sample of 50 students with IQ's from 90 through 110, and (d) Analysis IV: sample of 50 students with IQ's above 110.

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[7] Bennett, personal communication, October 6, 1967.

Methods of Defining Underachievement

This section describes the methods of selecting underachievers and the selected variables which were used in this study. It will be noted that all methods of selecting underachievers used in the present study were based on the relative discrepancy in standard scores between some measure of academic aptitude and some measure of academic performance. Operational definitions of underachievement for Methods 1 through 6 and Method 9 were formed at three levels of discrepancy between measures of academic aptitude and academic performance.

Method 1: Selection of Underachievers by Discrepancy between a Standardized Group Measure of Academic Aptitude and a Standardized Group Measure of Academic Performance

Academic aptitude was established by the Lorge-Thorndike Intelligence Test. Academic performance was measured by the Stanford Achievement Test. Grade equivalents from both tests were obtained for each student. Underachievement was operationally defined at three levels of discrepancy between academic aptitude and performance: (a) A grade equivalent score for academic performance which was .5 grade levels or more below the grade equivalent score for academic aptitude; (b) A grade equivalent score for academic performance which was 1.0 grade levels or more below the grade equivalent score for academic aptitude; and (c) A grade equivalent score for academic performance which was 1.5 grade levels or more below the grade equivalent score for academic aptitude.

Method 2: Selection of Underachievers by Discrepancy between a Standardized Individual Measure of Academic Aptitude and a Standardized Group Measure of Academic Performance

Academic aptitude was established by the *Wechsler Intelligence Scale for Children* (WISC). Academic performance was measured by the *Stanford Achievement Test*. Standard scores (*z* scores) from both tests were obtained for each student. The *z* score was determined for each subject's WISC score and *Stanford Achievement Test* score by using the mean and standard deviation of their respective standardization samples. Underachievement was then operationally defined at three levels of discrepancy between academic aptitude and academic performance: (a) A standard score for academic performance which was .5 or more below the standard score for academic aptitude; (b) A standard score for academic performance which was 1.0 or more below the standard score for academic aptitude; and (c) A standard score for academic performance which was 1.5 or more below the standard score for academic aptitude.

Method 3: Selection of Underachievers by Discrepancy between a Standardized Individual Measure of Academic Aptitude and a Standardized Individual Measure of Academic Performance

Academic aptitude was established by the *Wechsler*

Intelligence Scale for Children. Academic performance was measured by the Wide Range Achievement Test (WRAT). Standard scores (deviation IQ's, i.e., quotients which have a fixed mean of 100 and standard deviation of 15) were obtained from both tests for each student. Underachievement was operationally defined at three levels of discrepancy between academic aptitude and academic performance: (a) A quotient for academic performance which was 7.5 points or more (.5 standard deviation) below the quotient for academic aptitude; (b) A quotient for academic performance which was 15 points or more (1.0 standard deviations) below the quotient for academic aptitude; and (c) A quotient for academic performance which was 22.5 points or more (1.5 standard deviations) below the quotient for academic aptitude.

Method 4: Selection of Underachievers by Discrepancy between a Standardized Group Measure of Academic Aptitude and a Standardized Individual Measure of Academic Performance

Academic aptitude was established by the Lorge-Thorndike Intelligence Tests. Academic performance was measured by the Wide Range Achievement Test. Standard scores (z scores) were obtained for each subject's Lorge-Thorndike Intelligence Test score and Wide Range Achievement Test score by using the mean and the standard deviation of their respective standardization samples. Underachievement was then operationally defined at three levels of discrepancy between academic aptitude and academic performance: (a) A standard score for academic performance which was .5 or more below the standard score for academic aptitude; (b) A standard score for academic performance which was 1.0 or more below the standard score for academic aptitude; and (c) A standard score for academic performance which was 1.5 or more below the standard score for academic aptitude.

Method 5: Selection of Underachievers by Discrepancy between a Standardized Group Measure of Academic Aptitude and Teacher Grades (GPA)

Academic aptitude was established by the *Lorge-Thorndike Intelligence Test*. Academic performance was measured by grade point average. Standard scores (*z* scores) on both measures were obtained for each student. The *z* score was determined for each subject's *Lorge-Thorndike* score by using the mean and standard deviation of the standardization sample. The *z* score was obtained for each subject's grade point average by using the mean and standard deviation of the grade point averages in the randomly selected group of 100 students chosen for the study. Underachievement was then defined at three levels of discrepancy between academic aptitude and academic performance: (a) A standard score for academic performance which was .5 or more below the standard score for academic aptitude; (b) A standard score for academic performance which was 1.0 or more below the standard score for academic aptitude; and (c) A standard score for academic performance which was 1.5 or more below the standard score for academic aptitude.

Method 6: Selection of Underachievers by Discrepancy between a Standardized Individual Measure of Academic Aptitude and Teacher Grades (GPA)

Academic aptitude was established by the *Wechsler Intelligence Scale for Children*. Academic performance was measured by grade point average. Standard scores (*z* scores) were obtained for each student. The *z* score was determined for each subject's score on the *Wechsler Intelligence Scale for Children* by using the mean and standardized deviation of the standardization sample. The *z* score was obtained for each subject's grade point average by using the mean and the standard deviation of the grade point averages in the randomly selected group of 100 students chosen for study. Underachievement was then defined at three levels of discrepancy between academic aptitude and academic performance: (a) A standard score for academic performance which was .5 or more below the standard score for academic aptitude; (b) A standard score for academic performance which was 1.0 or more below the standard score for academic aptitude; and (c) A standard score for academic performance which was 1.5 or more below the standard score for academic aptitude.

Method 7: Selection of Underachievers by Student Judgment of Achievement

The student was asked to rate on paper his scholastic achievement in response to the following question: "How does your present school achievement compare with the way you think you *could* be doing: (a) Better than expected, (b) As well as expected, (c) Not as well as expected, (d) Much worse than expected." Students rating themselves in either of categories *c* or *d* were considered underachievers by self-rating.

Method 8: Selection of Underachievers by Teacher Judgment of Achievement

Midway in the school term, teachers of children in the study were asked to rate their scholastic achievement in response to the following question: "How does this student's present scholastic achievement compare with his academic potential: (a) Better than expected, (b) As well as expected, (c) Not as well as expected, (d) Much worse than expected." Students receiving ratings in either of categories *c* or *d* were considered underachievers by teacher rating.

Method 9: Selection of Underachievers by a Clinic Procedure

The psychological services of the school system from which the data were obtained used an adaptation of Jastak's procedure for evaluating achievement and basic personal adjustment. The adapted Jastak procedure is based on factor analysis of the *Wechsler Intelligence Scale for Children* and the *Wide Range Achievement Test*. Factors identified were (a) Altitude, (b) Verbal, (c) Reality, (d) Motivational, and (e) Psychomotor. *Altitude* is taken as a measure of academic aptitude; the other four factors are taken as measures of academic performance. In the adapted Jastak procedure, the *Wechsler Intelligence Scale for Children* is labeled *General Ability* and is used as an indicator of academic performance.

Altitude is defined as the maximum level of personality integration for a given individual. It suggests an ideal intellectual potential which may be developed to varying degrees but never fully reached. Therefore, the *expected ability range*, a modification of the altitude factor, is substituted for it. *Expected Ability* is an aptitude score which indicates the level of ability which an individual can realistically be expected to demonstrate in relation to his potential. Expected Ability (in our terms, academic aptitude), is determined in the following manner. Subtest scores from both the *Wechsler Intelligence Scale for Children* and the *Wide Range Achievement Test* are expressed as quotients. The three highest quotients are weighted and averaged to determine the *altitude quotient*. The *expected ability quotient* is 87% of the altitude quotient. Academic aptitude is expressed in terms of the expected ability quotient.

The *Verbal* Factor is considered an indicator of an individual's language and communication skills. The Reality Factor is considered an indicator of the appropriateness of an individual's behavior. The Motivational Factor is considered an indicator of an individual's performance on tasks which require persistent and purposeful activity. The Psychomotor Factor is considered an indicator of an individual's demonstrated muscular co-ordination and efficiency. The Verbal, Reality, Motivational, and Psychomotor Factors are expressed as quotients. These quotients are computed from weighted subtest scores from the Wechsler Intelligence Scale for Children and the Wide Range Achievement Test which are designated by Jastak's factor analysis. General Ability (the WISC Full Scale Quotient) is considered an indicator of demonstrated general intellectual functioning.

Each of the above factor quotients (Verbal, Reality, Motivational, Psychomotor, and General Ability) was compared with the Expected Ability Quotient. Underachievement for each of the Jastak factors and General Ability was operationally defined at each of three levels of discrepancy between academic aptitude and performance: (a) A factor quotient which was .5 SD or more (7.5 points or more) below the Expected Ability Quotients; (b) A factor quotient which was 1.0 SD or more (15 points or more) below the Expected Ability Quotient; and (c) A factor quotient which was 1.5 SD or more (22.5 points or more) below the Expected Ability Quotient.

Variable A: Student Academic Self-Concept

In this study, positive or negative self-concept was established on the basis of performance on the Self-Concept Q-Sort developed by Bennett for use with elementary age children. Negative self-concept in this study was considered a score on the Self-Concept Q-Sort which was below the median score for the random sample of 100 students.

Variable B: Student Perception of Control Over Environment

Following the student's rating of his own achievement, he was asked to evaluate on paper a statement suggested by Coleman (1966) to measure feeling of control over one's environment: "People like me don't have much of a chance to be successful in life." (a) Agree, (b) Disagree, (c) Not sure. A negative rating was considered to be either a or c.

Treatment of the Data[8]

Two major treatments were performed on the data. Both treatments were appropriate for use with dichotomized data. In this study, data from each method of defining underachievement and from each variable have been dichotomized into the the following categories: (a) Students selected as underachievers by a given method or variable; and (b) Students not selected as underachievers by a given method or variable.

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[8] The writer is indebted to Dr. Roy Sommerfeld for his assistance on the statistical treatment of the data and to John Gunn for programming the data for computer services.

Cochran's Test

Cochran's test (Hayes, 1965) was used to investigate the probability that selection as an underachiever would be equally distributed across six objective methods of selecting underachievers, two subjective methods of selecting underachievers, and a five-part clinic procedure for selecting underachievers. This test is considered appropriate for repeated observations where the dependent variable can take on only two values.

The statistic for Cochran's test is the following:

$$Q = \frac{J(J - 1) \sum_{j = 1}^{J} (Y_j - \bar{T})^2}{J\left(\sum_{k} Y_K\right) - \left(\sum_{k} Y_k^2\right)}$$

where J = number of subjects
K = number of observations or conditions
Y = 1 for success; 0 for failure
$Y_k = \sum_j Y_{jk}$ = marginal total for row K
$Y_j = \sum_k Y_{jk}$ = marginal total for column j
$\bar{T} = \frac{\sum_j Y_j}{J}$

Hayes stated that for a relatively large K, the distribution is approximately like that of X^2 for J - 1 degrees of freedom, when the hypothesis is true that the probability of selection as an underachiever is constant over all treatments of J (Hayes, 1965).

Tetrachoric Correlation (r_t)

In order to compare each of seven methods of defining underachievement and four selected variables, tetrachoric correlation was used. Tetrachoric correlation is appropriate in the case of two dichotomized variables when it can be assumed that both variables are essentially continuous and normally distributed (Edwards, 1964; Garrett, 1961).

There are several existing formulas for determining tetrachoric correlation coefficients. Most of the available methods for obtaining tetrachoric correlations are formulas which yield approximations of r_t and have some restrictions attached to them. Edwards (1964) and Garrett (1947) both presented estimations of the tetrachoric correlation coefficient which are appropriate when categories are formed by assigning scores or traits above the median of a distribution to one category and scores or traits below the median of a distribution to another category. Computation diagrams for the calculation of a larger number of tetrachoric r's have been devised by Thurstone and his associates (Chessire, Saffir, and Thurstone, 1933). Edwards pointed out, however, that the points of division on the variables involved must be taken into consideration in the use of these tables

(Edwards, 1964). Calculation of the standard error for tetrachoric correlation coefficients presents another difficulty in the use of tetrachoric r's in statistical analysis. Garrett (1947) stated that the standard error of r_t is from 50 to 100% larger than the standard error of a product-moment coefficient of the same size and based on the same sample size.

For more specific information on the calculation of tetrachoric correlation coefficients and the standard error, Garrett (1947) referred to *Statistical Procedures and Their Mathematical Bases* by Peters and Van Voorhis. The nature of the data in the present study required that tetrachoric correlations be calculated by a method in which the variables have not necessarily been dichotomized at the medians. The following formula by Pearson from Peters and Van Voorhis (1940) was chosen for use in the study.

$$r = \sin\frac{\pi}{2}\,\frac{\sqrt{ad}-\sqrt{bc}}{\sqrt{ad}+\sqrt{bc}}$$

where a = cases selected by category 1
b = cases not selected by category 1
c = cases selected by category 2
d = cases not selected by category 2

For testing the null hypothesis, *i.e.*, that there is no relationship between two given categories, Peters and Van Voorhis recommended the following formula for probable error of tetrachoric r when r equals 0, but h and k (the distances of the dichotomic lines) have any values:

P.E. of r_t when

$$\text{the true } r \text{ is } 0 = \frac{0.6745}{z_h z_k}\sqrt{\frac{(a + b)(a + c)(d + b)(d + c)}{N}}$$

$$= \frac{0.6745}{z_h z_k \sqrt{N}}\sqrt{p_h q_h p_k q_k}$$

Confidence levels for testing the hypothesis of no relationship between two dichotomized variables were established at .05 and .01 levels of significance (Garrett, 1947), Table 18). Where there were insufficient data to compute correlation coefficients between variables, the relationship was labeled indeterminate. (Computations were performed on the IBM S/360 Model 40 Computer located in the Computation Center of the University of North Carolina at Chapel Hill.)

The following chapter presents the results of the investigation proper.

CHAPTER III

RESULTS OF THE INVESTIGATION AND DISCUSSION

As previously stated, the purpose of this investigation was to explore the interrelationships among various methods of selecting underachievers in the elementary grades. Chapter I proposed the problem to be investigated and related the problem to selected literature on underachievement. Information concerning the subjects, instrumentation, procedure, definitions, and treatment of the data was reported in Chapter II. The present chapter reports the findings of the investigation and also includes discussion of the findings and their implications.

In order to investigate the interrelationships among six objective methods of selecting underachievers, two subjective methods of selecting underachievers, and two variables frequently associated with underachievement, tetrachoric correlation coefficients were computed among the nine methods and two variables. An overall test for the interrelationships among the six objective methods, the two subjective methods, and the five-part clinic procedure for selecting underachievers was made by means of the Cochran's test. Computations were made for three levels of discrepancy between measures of academic aptitude and academic performance: (a) a discrepancy of .5 SD or more, (b) a discrepancy of 1.0 SD or more, and (c) a discrepancy of 1.5 SD or more.

Four separate analyses were made using different samples from a sixth grade white male population: (a) a random sample of 100 students, (b) a sample of 50 students with IQ's below 90, (c) a sample of 50 students with IQ's from 90 through 110, and (d) a sample of 50 students with IQ's above 110.

It should be noted that some of the tetrachoric correlation coefficients were indeterminate for the samples chosen for this study. Coefficients were unobtainable when too few cases occurred in one or more quadrants of the two-by-two contingency table required to compute the tetrachoric correlation coefficient.

Subsidiary Data

In order to provide some additional information considered pertinent to the interrelationships among various methods of selecting underachievers, correlation coefficients were computed between the specific measures of academic aptitude and the specific measures of academic performance which were used in Methods 1 through 6 and Method 9. Data from the random sample of 100 sixth grade males was used.

Table 1 reports the intercorrelations of the aptitude measures. The aptitude measures used were: (a) The Lorge-

TABLE 1

Intercorrelations of the Aptitude Measures
Used in Methods 1 through 6 and Method 9
for the Random Sample of 100
Sixth Grade Males

Aptitude Measures	Aptitude Measures	
	WISC	EAQ
LT	$.716^{***}$	$.710^{***}$
WISC		$.927^{***}$
EAQ		

$^{**}p < .001.$

Thorndike Intelligence Tests (LT), (b) Wechsler Intelligence Scale for Children (WISC), and (c) Expected Ability Quotient (EAQ) from the adapted Jastak procedure.

As will be noted from Table 1, all the correlation coefficients between the measures of academic aptitude were significant beyond the .001 level.

Table 2 reports the intercorrelations of the achievement measures. The achievement measures used were: (a) Stanford Achievement Test (St.A.T.), (b) Wide Range Achievement Test (WRAT), (c) Grade point average (GPA), (d) Verbal Factor (V), (e) Reality Factor (R), (f) Motivational Factor (M), (g) Psychomotor Factor (P), and (h) General Ability (GA).

It will be seen from Table 2 that all the correlation coefficients between the measures of academic achievement were significant beyond the .001 level.

Table 3 reports the intercorrelations of the achievement measures and the aptitude measures. Measures used were the same as those included in Tables 1 and 2.

A reference to Table 3 will show that all the correlation coefficients between the measures of academic aptitude and the measures of academic achievement were significant beyond the .001 level. It should be noted that, for the purposes of this study, the WISC Full Scale Quotient was also called General Ability, thus accounting for the correlation coefficient of .999 between WISC scores and General Ability. Computer translation of decimal system data to

TABLE 2

Intercorrelations of the Achievement Measures
Used in Methods 1 through 6 and Method 9
for the Random Sample of 100
Sixth Grade Males

Achievement Measures	Achievement Measures						
	WRAT	GPA	V	R	M	P	GA
St.A.T.	.803***	.806***	.798***	.555***	.819***	.702***	.751***
WRAT		.715***	.811***	.492***	.861***	.742***	.709***
GPA			.661***	.425***	.714***	.591***	.619***
V				.688***	.792***	.740***	.882***
R					.554***	.717***	.875***
M						.794***	.821***
P							.827***
GA							

$^{***}p < .001$.

TABLE 3

Intercorrelations of the Achievement Measures and the Aptitude Measures Used in Methods 1 through 6 and Method 9 for the Random Sample of 100 Sixth Grade Males

Achievement Measures	Aptitude Measures		
	L-T	WISC	EAQ
St.A.T.	.854***	.750***	.704***
WRAT	.787***	.703***	.668***
GPA	.759***	.621***	.604***
V	.726***	.882***	.799***
R	.507***	.891***	.805***
M	.810***	.818***	.790***
P	.725***	.842***	.792***
GA	.713***	.999***	.918***

***$p < .001$.

binary system data for processing and the translation of binary system to decimal system data and resulted in an infinite repeating decimal of .999, rather than a correlation coefficient of 1.0.

Discussion

The findings reported in Tables 1, 2, and 3 and the implications of these findings will provide a frame of reference for considering the data reported and discussed in Analyses I through IV which concerns the interrelationships among various relative discrepancy methods of selecting underachievers.

1. The highly significant intercorrelations (.001 level) among the aptitude measures used in this study suggest, for the random sample, a high degree of relationship among the *Lorge-Thorndike Intelligence Tests*, the *Wechsler Intelligence Scale for Children*, and the Expected Ability Quotient of the adapted Jastak procedure.

2. The highly significant intercorrelations (.001 level) among the achievement measures used in this study suggest, for the random sample, a high degree of relationship among the *Stanford Achievement Test*, the *Wide Range Achievement Test*, and the adapted Jastak factors. It should be pointed out however, that the interrelationships among the Jastak factors would tend to raise a question regarding the statistical independence of these factors.

3. The highly significant intercorrelations (.001 level) between the measures of academic aptitude and the measures of academic performance used in this study suggest, for the random sample, a high degree of relationship between academic aptitude and academic achievement.

In view of the interrelationships reported in the preceding paragraphs, it might be expected that intercorrelations among methods of selecting underachievers based on the relative discrepancy in standard score units between aptitude and performance (using the same measures discussed above) would tend to be statistically significant. In the four analyses which follow, it will be seen that such was not the case. A possible interpretation would be that when significant correlation coefficients did not occur between methods of selecting underachievers, the non-significant correlation coefficients could be attributed to other than chance fluctuation. An alternative interpretation rests on the probability that a number of correlation coefficients will attain statistical significance due to the chance fluctuation which occurs when a large number of interrelations are computed.

The specific questions raised in Chapter I will now be considered in the order in which they were presented in Chapter I for each of the four separate analyses mentioned previously. Discussion of the results and their implications will follow the presentation of data for each question.

Analysis I: Randomly Selected Group of 100 Students

Question 1: Is the Probability of Selection as an Underachiever Equally Distributed across Six Objective Methods of Selecting Underachievers, Two Subjective Methods of Selecting Underachievers, and a Five-Part Clinic Procedure for Selecting Underachievers, for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 4 reports the values for the Cochran's Test at three levels of discrepancy between academic aptitude and performance. It will be seen from Table 4 that the values for the Cochran's Test, at all three levels of discrepancy, were significant at the .01 level.

Discussion. The findings reported in Table 4 indicate that selection as an underachiever was not equally probable among the six objective methods of selecting underachievers, the two subjective methods, and the five-part clinic procedure for selecting underachievers. The larger values obtained for 1.0 SD or more and 1.5 SD or more discrepancy between aptitude and performance suggest that the size of the discrepancy selected for defining underachievement may affect the interrelationships among the nine methods of selecting underachievers in a random sample of 100 sixth grade students.

Question 2: What Are the Interrelationships among the Six Objective Methods of Selecting Underachievers for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

TABLE 4

Values for the Cochran's Test at Three Levels of Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

Sample	Levels of Discrepancy		
	.5 SD	1.0 SD	1.5 SD
Random Sample	50.82**	131.17**	296.28**

**$p < .01$.

Table 5 summarizes the findings for the intercorrelations among the six objective methods of selecting underachievers when a discrepancy of .5 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be seen from the intercorrelations reported in Table 5 that correlation coefficients significant at the .01 level were found between the following methods of selecting underachievers: (a) Method 1 and Methods 2, 4, 5; (b) Method 2 and Methods 1, 3, 6; (c) Method 3 and Methods 2, 4, 6; (d) Method 4 and Methods 1, 3, 5; (e) Method 5 and Methods 1, 4, 6; and (f) Method 6 and Methods 2, 3, 5. Correlation coefficients between the following methods were non-significant at the .05 level: (a) Method 1 and Methods 3, 6; (b) Method 2 and Methods 4, 5; (c) Method 3 and Methods 1, 5; (d) Method 4 and Methods 2, 6; (e) Method 5 and Methods 2, 3; and (f) Method 6 and Methods 1, 4.

A synthesis of the above data indicates that for a discrepancy of .5 SD or more a correlation coefficient between two methods of selecting underachievers was significant at the .01 level whenever the two methods used either the same measure of academic aptitude or the same measure of academic performance.

Table 6 summarizes the findings for the intercorrelations among the six objective methods of selecting underachievers when a discrepancy of 1.0 SD or more between

TABLE 5

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	.431**	.171	.615**	.593**	.257
Method 2[b]		.672**	.016	.218	.678**
Method 3[c]			.528**	.118	.555**
Method 4[d]				.459**	.023
Method 5[e]					.751**
Method 6[f]					

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

TABLE 6

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	.237	.021	.778**	.682*	.123
Method 2[b]		.778**	.005	.288	.843**
Method 3[c]			.222	.324	.789**
Method 4[d]				.853*	.244
Method 5[e]					.177
Method 6[f]					

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be noted from the intercorrelations reported in Table 6 that correlation coefficients significant at the .05 level were found between Method 1 and Method 5 and between Method 4 and Method 5. Correlation coefficients significant at the .01 level were found between the following methods of selecting underachievers: (a) Method 1 and Method 4; (b) Method 2 and Methods 3, 6; (c) Method 3 and Methods 2, 6; (d) Method 4 and Methods 1, 6; and (e) Method 6 and Methods 2, 3. Correlation coefficients for the following methods were non-significant at the .05 level: (a) Method 1 and Methods 2, 3, 6; (b) Method 2 and Methods 1, 4, 5; (c) Method 3 and Methods 1, 4, 5; (d) Method 4 and Methods 2, 3, 5; (e) Method 5 and Methods 2, 3, 6; and (f) Method 6 and Methods 1, 4, 5.

A synthesis of the above data indicates, for a discrepancy of 1.0 SD or more between aptitude and performance, that a correlation coefficient between two methods of selecting underachievers was significant whenever the two methods used the same measure of academic aptitude.

Table 7 summarizes the findings for the intercorrelations among the six objective methods of selecting underachievers when a discrepancy of 1.5 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

TABLE 7

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	IND	.424	.866*	IND	IND
Method 2[b]		.888*	IND	IND	.921*
Method 3[c]			.757	IND	.672
Method 4[d]				IND	IND
Method 5[e]					IND
Method 6[f]					

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

It will be seen from Table 7 that of the correlation coefficients obtained at a discrepancy of 1.5 SD or more, 9 of the 15 coefficients were unobtainable for the sample under study. Correlation coefficients significant at the .05 level were found between Methods 2 and 3, Methods 1 and 4, and Methods 5 and 6.

Discussion. The results for a discrepancy of .5 SD or more between aptitude and performance indicate that in the random sample of 100 male sixth grade students, there was a relationship between two methods of selecting underachievers when the methods employed either the same measures of academic aptitude or the same measure of academic performance. Consideration of this finding suggests the possibility that .5 SD may be too small a discrepancy to indicate differences between academic aptitude and academic performance due to other than chance fluctuation.

The results for a discrepancy of 1.0 SD or more between aptitude and performance indicate that in the sample under study, there was a relationship between two methods of selecting underachievers when both methods used the same measure of academic aptitude. Thus, in the present study, a correlation coefficient between two methods of selecting underachievers was significant (.05 level or .01 level) when both methods employed either a standardized group intelligence test or a standardized individual intelligence test. This finding does not support the frequently held assumption that a relationship exists between methods of selecting underachievers which employ the same criterion of academic performance. The data for the intercorrelations among the achievement measures themselves likewise tends not to support a relationship between methods of selecting underachievers which employ the same criterion of academic performance. A correlation coefficient (.001 level) between the Stanford Achievement Test and the Wide Range Achievement Test, between grade point average and the Stanford Achievement Test, and between grade point average and the Wide Range Achievement Test.

The findings for the 1.5 SD level of discrepancy, with the majority of the coefficients indeterminate, suggests that a discrepancy of 1.5 SD or more may be too large to permit comparisons among methods of selecting underachievers in a sample of 100 subjects.

Question 3: What is the Relationship between the Two Subjective Methods of Selecting Underachievers?

A correlation coefficient of .265, which was significant at the .05 level, was obtained between the two subjective methods of selecting underachievers, *i.e.*, student judgment of achievement and teacher judgment of achievement. (Level of discrepancy between academic aptitude and academic performance was not involved in the comparison between the two subjective methods of selecting underachievers.)

Discussion. These results indicate that there was a relationship between selection as an underachiever by student judgment of achievement and selection as an underachiever by teacher judgment of achievement for the random sample of 100 sixth grade boys.

Question 4: What Are the Interrelationships among the Two Subjective Methods of Selecting Underachievers and the Six Objective Methods of Selecting Underachievers, for each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 8 records the results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods of selecting underachievers when a discrepancy of .5 SD or more between academic aptitude and academic performance was used by the objective methods as a criterion for underachievement.

A reference to Table 8 will show that the correlation coefficients between Method 7 and Methods 5 and 6 were significant at the .05 level. The correlation coefficients between Method 8 and Methods 5 and 6 were significant at the .01 level. Significant correlation coefficients were not found between Method 7 and Methods 1, 2, 3, and 4 nor between Method 8 and Methods 1, 2, 3, and 4.

The results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods, at a discrepancy of 1.0 SD or more between aptitude and performance, are recorded in Table 9.

It will be noted from Table 9 that all of the correlation coefficients between Method 7 and Methods 1 through 6

TABLE 8

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.113	.101	.253	.075	.312*	.312*
Method 8[h]	.127	.164	.238	.166	.558**	.453**

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

TABLE 9

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

Subjective Methods of Selecting Underachivers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.107	.049	.184	.097	.017	.203
Method 8[h]	.182	.150	.299*	.549**	IND	.330*

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

were non-significant at the .05 level. The correlation coefficients between Method 8 and Methods 3 and 6 were significant at the .05 level. The coefficient between Method 8 and Method 4 was significant at the .01 level.

Table 10 records the results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods, when a discrepancy of 1.5 SD or more between aptitude and performance was used as the criterion for underachievement by the objective methods.

It will be observed from Table 10 that four of the correlation coefficients between Method 7 and Methods 1 through 6 were indeterminate for this sample. Correlation coefficients significant at the .05 level were found between Method 8 and Methods 2 and 3. The remaining coefficients between Method 8 and the other methods were either non-significant at the .05 level or indeterminate for this sample.

Discussion. The results presented in the preceding paragraphs show evidence of the following interrelationships among the two subjective methods of selecting underachievers and the six objective methods of selecting underachievers for the random sample of 100 sixth grade males:

1. When a discrepancy of .5 SD or more between aptitude and performance was used by the objective methods as the criterion for selection as an underachiever, the findings indicated a relationship between selection as an underachiever by student judgment of achievement and the two

TABLE 10

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.270	.260	.340	.099	IND	IND
Method 8[h]	.148	.476*	.567*	.353	IND	.066

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

objective methods of selecting underachievers which used grade point average to establish academic performance. There was also a relationship between selection as an underachiever by teacher judgment of achievement and the two objective methods of selecting underachievers which used grade point average to establish academic performance. The findings for a discrepancy of .5 SD or more, however, did not show evidence of a significant relationship between the two subjective methods of selecting underachievers and the four objective methods of selecting underachievers which used individual or group standardized achievement test data to establish academic performance.

2. For a discrepancy of 1.0 SD or more, the results did not show evidence of a relationship between selection as an underachiever by student judgment of achievement and any of the six objective methods of selecting underachievers. The findings did indicate a relationship between selection as an underachiever by teacher judgment of achievement and by three of the six objective methods of selecting underachievers.

3. When a discrepancy of 1.5 SD or more was used, the findings did not show evidence of a relationship between selection as an underachiever by student judgment of achievement and four of the six objective methods of selecting underachievers. Two of the coefficients were indeterminate for this sample. A relationship was found between selection

as an underachiever by teacher judgment of achievement and two of the six methods of selecting underachievers.

From the above discussion, it is suggested that the interrelationships among the two subjective methods of selecting underachievers and the six objective methods may have some implications for the criteria by which students and teachers select underachievers.

For example, when a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for underachievement, students whose grades were thus only slightly below their potential tended to be selected by their teachers as underachievers and to select themselves as underachievers. The results did not, however, suggest a tendency for students with group or individual standardized achievement test scores slightly below their potential to be selected by their teachers as underachievers. When the discrepancy between aptitude and performance was increased to 1.0 SD and above or 1.5 SD and above for the six objective methods of selecting underachievers, students selected as underachievers by their teachers tended to be selected as underachievers by at least two of the six objective methods. However, students who selected themselves as underachievers tended not to be selected as underachievers by any of the six objective methods of selecting underachievers when discrepancies of 1.0 SD and above or 1.5 SD and above were used as criteria for underachievement.

These considerations suggest that a question may be raised regarding the criterion by which students and teachers select underachievers. It is possible that for the sample under study, the criterion by which students and teachers judged underachievement may not, in effect, have been based on the relative discrepancy between academic aptitude and academic performance, as requested. Other factors may have entered into the subjective selection of underachievers by teachers and students. For example, students might have evaluated their own achievement in terms of criteria such as perception of teacher approval, academic self-concept, perceived competence (social or academic) in relation to other students, inaccurate appraisal of their own intelligence, and the like. Teachers might have used such criteria as acceptability of student behavior, similarity of teacher and student non-academic values, students' academic performance in relation to the performance of other students, inaccurate appraisal of students' academic aptitude, etc.

Question 5: What Are the Interrelationships among the Five Parts of the Clinic Procedure for Selecting Underachievers, for each of Three Levels of Discrepancy between Measures of Academic Aptitude and Performance?

Table 11 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when a discrepancy of .5 SD or more between the

TABLE 11

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	.603**	.660**	.003	.658**
V Factor[b]		.333*	.370*	.379**
R Factor[c]			.205	.234
M Factor[d]				.600**
P Factor[e]				

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

Expected Ability Quotient and each factor score (see Chapter II, page 62) was used as the criterion for underachievement.

A reference to Table 11 will show that of the 10 correlation coefficients obtained, 5 were significant at the .01 level and 2 were significant at the .05 level. Only 3 of the 10 coefficients were non-significant at the .05 level.

The intercorrelations among the five parts of the clinic procedure for selecting underachievers, when a discrepancy of 1.0 SD or more was used, are summarized in Table 12.

It will be seen from Table 12 that among the 10 correlation coefficients obtained, 4 were indeterminate for the sample under study, 2 were significant at the .01 level, 1 was significant at the .05 level, and 3 were non-significant at the .05 level.

Table 13 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when a discrepancy of 1.5 SD or more between academic aptitude and performance was used as the criterion for underachievement.

It will be seen from Table 13 that all 10 of the correlation coefficients among the five parts of the clinic procedure for selecting underachievers were indeterminate for the sample under study, when a discrepancy of 1.5 SD or more was used as the criterion for selecting underachievers.

TABLE 12

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for Random Sample of 100 Sixth Grade Males

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	IND	IND	IND	IND
V Factor[b]		.300	.552**	.413*
R Factor[c]			.397	.241
M Factor[d]				.627**
P Factor[e]				

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

TABLE 13

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	IND	IND	IND	IND
V Factor[b]		IND	IND	IND
R Factor[c]			IND	IND
M Factor[d]				IND
P Factor[e]				

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

Discussion. It was noted in Chapter II of the present study that the five parts of the clinic procedure for selecting underachievers were adapted from Jastak's factor analysis of the *Wechsler Intelligence Scale for Children* and the *Wide Range Achievement Test* (pages 61 and 62). It is beyond the scope of the present work to discuss either Jastak's theoretical assumptions or the principles and procedures of factor analysis. (It has been noted previously, however, that the scores used to represent the clinic procedure in this study were not "factor scores." They were scores based on the discrepancy between a factor score and a measure of academic aptitude, the Expected Ability Quotient, which was described in Chapter II.)

The intercorrelations reported in Tables 7, 8, and 9 indicate, for the sample under study, that there were interrelationships among the five parts of the clinic procedure for selecting underachievers for discrepancies of .5 SD or more and 1.0 SD or more between academic aptitude and academic performance. For a discrepancy of 1.5 SD or more, all of the intercorrelations were indeterminate for the sample under study.

In view of the interrelationships reported at the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance, a question was raised regarding the possibility of interrelationships among the factor scores themselves. Table 2, page 73, reported the intercorrelations among the measures of achievement used in this study. A reference to Table 2 will show that the intercorrelations among the factor scores themselves were all significant beyond the .001 level. These findings suggest that investigation of the procedures by which the Jastak factors were obtained would be desirable.

Question 6: What Are the Interrelationships among the Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers, at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 14 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, when a discrepancy of .5 SD or more between academic aptitude and academic performance was used as the criterion for selecting underachievers.

A reference to Table 14 will show that of the 30 correlation coefficients among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers three of the coefficients were significant at the .05 level, three were significant at the .01 level, and 24 were non-significant at the .05 level. Of the six correlation coefficients significant at the .05 or .01 levels, four were between the Motivational Factor and Methods 2, 3, 4, and 6. Correlation coefficients significant at the .05 level were found between the Verbal Factor and

TABLE 14

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	.010	.353*	.062	.193	.129
Method 2[g]	.397	.174	.524	.441**	.000
Method 3[h]	.156	.148	.447	.654**	.286*
Method 4[i]	.131	.219	.041	.370*	.028
Method 5[j]	.180	.131	.432	.234	.104
Method 6[k]	.715	.247	.338	.401	.234

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[g] Discrepancy between WISC and *Stanford Achievement Test*.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between *Lorge-Thorndike* and WRAT.

[j] Discrepancy between *Lorge-Thorndike* and GPA.

[k] Discrepancy between WISC and GPA.

[*] $p < .05$.

[**] $p < .01$.

Method 1 and between the Psychomotor Factor and Method 3. None of the correlation coefficients between the General Ability Factor and the six objective methods was significant at the .05 level; none of the correlation coefficients between the Reality Factor and the six objective methods was significant at the .05 level.

Table 15 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, when a discrepancy of 1.0 SD or more between academic aptitude and academic performance was used as a criterion for selecting underachievers.

It will be noted from Table 15 that of the 30 intercorrelations among the five parts of the clinic procedure and the six objective methods of selecting underachievers 9 of the coefficients were indeterminate for the sample under study, 3 were significant at the .05 level, 4 were significant at the .01 level, and 14 were non-significant at the .05 level. Of the 7 significant correlation coefficients (at the .05 level or the .01 level), 3 were between the Motivational Factor and Methods 2, 3, and 4; 3 were between the Psychomotor Factor and Methods 2, 3, and 6; and 1 was between the Verbal Factor and Method 2.

Table 16 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting

TABLE 15

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	IND	.162	.237	.179	.160
Method 2[g]	IND	.444*	IND	.485*	.504*
Method 3[h]	IND	.287	.438	.750**	.748**
Method 4[i]	IND	.379	.005	.607**	.439
Method 5[j]	IND	.083	IND	.369	.114
Method 6[k]	IND	.132	IND	.336	.723**

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[g] Discrepancy between WISC and Stanford Achievement Test.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between Lorge-Thorndike and WRAT.

[j] Discrepancy between Lorge-Thorndike and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

TABLE 16

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	IND	IND	IND	IND	IND
Method 2[g]	IND	.890	IND	.735	IND
Method 3[h]	IND	.859	IND	IND	IND
Method 4[i]	IND	IND	IND	IND	IND
Method 5[j]	IND	IND	IND	IND	IND
Method 6[k]	IND	.890	IND	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[g] Discrepancy between WISC and *Stanford Achievement Test*.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between *Lorge-Thorndike* and WRAT.

[j] Discrepancy between *Lorge-Thorndike* and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

underachievers, when a discrepancy of 1.5 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

A reference to Table 16 will show that of the 30 intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods, 26 correlation coefficients were indeterminate for the sample under study. The other 4 correlation coefficients were non-significant at the .05 level.

Discussion. The results reported for the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance showed evidence of only a few interrelationships, at each of these levels, among the five parts of the clinic procedure and the six objective methods of selecting underachievers. A reference to Table 2, page 73, which reports the intercorrelations among the measures of achievement themselves, will show that significant correlation coefficients (.001 level) were obtained between each of the factor quotients and each of the other achievement measures. These findings suggest that while there were relationships between the factors scores per se and the measures of academic achievement, there did not tend to be many relationships between the factor discrepancy scores and the objective methods of selecting underachievers. On the basis of these findings, a question may be raised regarding the usefulness of the factor discrepancy scores as methods of selecting underachievers. It is possible, however, that the factor discrepancy scores may deal with dimensions of underachievement different from those of the objective methods of selecting underachievers.

Among the relationships observed for a discrepancy of .5 SD or more between aptitude and performance, a relationship was found between selection of underachievers by the Motivational Factor and Methods 2, 3, 4, and 6. A relationship was found between the Psychomotor Factor and Method 3. At a discrepancy of 1.0 SD or more, there was a relationship between the selection of underachievers by the Motivational Factor and Methods 2, 3, and 4. A relationship was also found between the selection of underachievers by the Psychomotor Factor and Methods 2, 3, and 6. When a discrepancy of 1.5 SD or more was used as the criterion for selecting underachievers, the majority of the coefficients were indeterminate for the sample under study.

It will be noted from the preceding paragraph that a relationship with Method 3 was found for each factor which was related to at least one objective method of selecting underachievers. Method 3 was based on the discrepancy between scores obtained on the WISC and the WRAT. The five adapted Jastak factors of the clinic procedure were based on the discrepancy between the Expected Ability Quotient and a factor score. It should be pointed out that both the Expected Ability Quotient and the factor score were obtained from subtest scores on the WISC and the WRAT (see Chapter II, page 62). Thus, the relationship between Method 3 and several of the factor discrepancy scores was not surprising.

Question 7: What Are the Interrelationships among the Five Parts of the Clinic Procedure and the Two Subjective Methods of Selecting Underachievers at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 17 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers when a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

It will be noted from Table 17 that all 10 of the intercorrelations between the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers were non-significant at the .05 level.

Table 18 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of 1.0 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

TABLE 17

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Academic Performance for a Random Sample of 100 Sixth Grade Males

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	.203	.207	.039	.214	.041
Method 8[g]	.073	.098	.052	.206	.234

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

* $p < .05$.

** $p < .01$.

TABLE 18

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Academic Performance for a Random Sample of 100 Sixth Grade Males

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	IND	.468**	.049	.267	.265
Method 8[g]	IND	.131	.174	.311*	.753**

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

A reference to Table 18 will show that of the correlation coefficients between the five parts of the clinic procedure for selecting underachievers and Method 7, three of the coefficients were non-significant at the .05 level and one was indeterminate for the sample under study. The correlation coefficient between the Verbal Factor and Method 7 was significant at the .01 level.

It can also be seen from Table 18 that of the correlation coefficients between the five parts of the clinic procedure and Method 8, two of the coefficients were non-significant at the .05 level and one was indeterminate for the sample under study. The correlation coefficients between Method 8 and the Motivational and Psychomotor Factors were significant at the .05 and .01 levels, respectively.

Table 19 records the results of the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of 1.5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

A reference to Table 19 will show that seven of the ten correlation coefficients between the two subjective methods of selecting underachievers and the five parts of the clinic procedure were indeterminate for the sample

TABLE 19

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Academic Performance for a Random Sample of 100 Sixth Grade Males

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	IND	IND	IND	.260	IND
Method 8[g]	IND	.064	IND	.366	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

under study. The other three correlation coefficients were non-significant at the .05 level.

Discussion. The results reported at all three levels of discrepancy between aptitude and performance showed evidence of only a few interrelationships among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers for the random sample of 100 sixth grade males.

For a discrepancy of .5 SD or more between academic aptitude and performance, the findings did not show evidence of a relationship between selection as an underachiever by student judgment of achievement or teacher judgment of achievement and any of the five parts of the clinic procedure for selecting underachievers.

When a 1.0 SD or more discrepancy was used, there was a relationship between selection as an underachiever by student judgment of achievement and selection by the Verbal Factor. There was also a relationship between selection as an underachiever by teacher judgment of achievement and selection by the Motivational and Psychomotor Factors.

For 1.5 SD or more discrepancy, with the majority of the correlation coefficients indeterminate for this sample, the data were insufficient for making meaningful generalizations.

It will be noted from the above discussion that significant intercorrelations (at the .05 or .01 levels) among the two subjective methods of selecting underachievers and the five parts of the clinic procedure occurred only at a discrepancy of 1.0 SD or more between aptitude and performance. These data indicate a relationship between selection as an underachiever by teacher judgment of achievement and the Motivational and Psychomotor Factors. It will be recalled from Table 14 (page 100) that of seven significant correlation coefficients (.05 or .01 levels) among the six objective methods of selecting underachievers and the five parts of the clinic procedure, six of the significant coefficients were between the objective methods and the Motivational and Psychomotor Factors.

From the data referred to in the preceding paragraph, it is suggested that selection of underachievers based on the discrepancy between the Expected Ability Quotient (see Chapter II) and the Motivational and Psychomotor Factors may have some value as operational definitions of underachievement. Further investigation of this possibility is needed.

The non-significant correlations (.05 level) at .5 SD discrepancy or more between academic aptitude and performance and the indeterminate correlations (for this sample) at 1.5 SD discrepancy or more suggest that the .5 SD and 1.5 SD levels of discrepancy between measures of aptitude and performance may be inappropriate for use as operational definitions of underachievement.

Question 8: What is the Relationship between the Two Measures of Self-Perception?

A correlation coefficient of .657, which was significant at the .01 level, was obtained between the two measures of self-perception, *i.e.*, student academic self-concept and student perception of control over environment. (Level of discrepancy between academic aptitude and academic performance was not involved in the comparison between the two measures of self-perception.)

Discussion. These results indicate that there was a relationship between student academic self-concept and negative perception of control over environment for the random sample of 100 sixth grade boys. That is to say, students who agreed with or were not sure about the statement "People like me don't have much of a chance to be successful in life" tended to have negative academic self-concepts in the sample under study.

Question 9: What Are the Interrelationships among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 20 records the results for intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a .5 SD

TABLE 20

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.169	.245	.155	.180	.118	.386**
Variable B[h]	.127	.322	.011	.148	.184	.121

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

discrepancy or more between aptitude and performance was used as the criterion for selecting underachievers by each of the objective methods.

It will be seen from Table 20 that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 11 of the correlation coefficients were non-significant at the .05 level. The correlation coefficient between student academic self-concept and Method 6 was significant at the .01 level.

Table 21 records the results for intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a 1.0 SD discrepancy or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

A reference to Table 21 will show that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 9 of the correlation coefficients were non-significant at the .05 level, one was indeterminate for the sample under study and 2 were significant at the .01 level. The two significant coefficients were between Student Academic Self-Concept and Method 3 and between Perception of Control over Environment and Method 5.

Table 22 records the intercorrelations among the two measures of self-perception and the six objective methods

TABLE 21

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.087	.259	.414**	.113	IND	.279
Variable B[h]	.273	.326	.160	.051	.678**	.006

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

TABLE 22

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.198	.016	.531*	.259	IND	.016
Variable B[h]	.438*	.210	.070	.048	IND	.210

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

of selecting underachievers, when a 1.5 SD discrepancy or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

It will be observed from Table 22 that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 8 of the correlation coefficients were non-significant at the .05 level, 2 were indeterminate for the sample under study, and 2 were significant at the .05 level. The two significant coefficients were between Student Academic Self-Concept and selection as an underachiever by Method 3 and between Student Perception of Control over Environment and selection as an underachiever by Method 1.

Discussion. The intercorrelations between student academic self-concept (Variable A) and the six objective methods of selecting underachievers give evidence of only one relationship between academic self-concept and the six objective methods at each of the three levels of discrepancy between academic aptitude and academic performance. When a discrepancy of .5 SD or more was used as the criterion for selecting underachievers, a relationship was found between negative self-concept and selection as an underachiever by Method 6. For a discrepancy of 1.0 SD or more, there was a relationship between negative academic self-concept and selection as an underachiever by Method 3. At the 1.5 SD or more level of discrepancy, a relationship was found between negative academic self-concept and selection as an underachiever by Method 3.

The lack of relationships, for the sample under study, between negative self-concept and academic underachievement (operationally defined by six relative discrepancy methods of selecting underachievers) contradicts a general trend in the literature (see Chapter I) to report a relationship between negative self-concept and various definitions of academic underachievement.

Since a relationship between negative self-concept and academic underachievement among males has been fairly well established by various investigators (Campbell, 1966; Fink, 1962; Shaw, Edson, & Bell, 1960; Shaw & Grubb, 1958), the findings of the present investigation would seem to have some implications relevant to the particular instrument used to establish academic self-concept, _i.e._, the _Self-Concept Q-Sort_ (SCQ). It will be recalled from Chapter II that the SCQ is an unstandardized instrument. Scores representing negative self-concept were obtained by a median split on the SCQ scores obtained from the random sample of 100 males. Thus, a possibility exists that a median split may not discriminate, for this instrument, between students who might have negative academic self-concepts and those who do not.

The data for the relationship between Negative Perception of Control over Environment and each of the six objective methods of selecting underachievers showed no relationships at the .5 SD or more level of discrepancy, one relationship at the 1.0 SD or more level of discrepancy, and one relationship at the 1.5 SD or more level of discrepancy. These findings may be taken to indicate, for the sample under study, that students with negative perception of control over environment did not tend to be selected as underachievers by the six objective methods for all three levels of discrepancy between academic aptitude and performance. That is to say, students agreeing with or not sure about the statement "People like me don't have much of a chance to be successful in life" were not generally selected as underachievers by the six objective methods of selecting underachievers.

Question 10: What Are the Interrelationships among the Two Measures of Self-Perception and the Two Subjective Methods of Selecting Underachievers?

Table 23 gives the intercorrelations among the two measures of self-perception and the two subjective methods of selecting underachievers. (Level of discrepancy between aptitude and performance was not involved in these comparisons.)

It will be seen from Table 23 that the correlation

TABLE 23

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Two Subjective Methods of Selecting Underachievers for a Random Sample of 100 Sixth Grade Males

Measures of Self-Perception	Subjective Methods of Selecting Underachievers	
	Method 7[a]	Method 8[b]
Variable A[c]	.440**	.092
Variable B[d]	.341*	.176

[a] Selection of underachievers by student judgment of achievement.

[b] Selection of underachievers by teacher judgment of achievement.

[c] Student academic self-concept.

[d] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

coefficient between Variable A and Method 7 was significant at the .01 level. There was also a significant correlation coefficient (.05 level) between Variable B and Method 7. The correlation coefficients between Method 8 and Variables A and B were not significant at the .05 level.

Discussion. For the random sample of 100 male sixth grade students, these results indicated that there was a relationship between selection of underachievers by student judgment of achievement and both negative academic self-concept and negative perception of control over environment. That is, students selecting themselves as underachievers also tended to have negative academic self-concepts and to have negative perception of control over environment. The non-significant correlation coefficients (.05 level) between Method 8 and Variables A and B suggest that students with negative self-concepts or with negative perception of control over environment tended not to be selected by their teachers as underachievers.

These results give evidence that the individual psychological characteristics of both teacher and child have some influence on perception of scholastic underachievement. There is a possibility that teachers may feel sorry for those children with negative attitudes about themselves and about their achievement and thus, may tend to feel that the academic achievement of these children is "as good as expected."

On the other hand, it is possible that the children with negative self-concepts or negative perception of control over environment may expect higher performance of themselves than their teachers expect of them. These speculations should be subjected to systematic investigation using more fully developed instruments to measure self-concept and perception of control over environment.

Question 11: What Are the Interrelationships among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers, for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Performance?

Table 24 summarizes the intercorrelations between the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers when a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by each of the five parts of the clinic procedure.

It will be seen from Table 24 that of the 10 intercorrelations among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, 9 of the 10 correlation coefficients were non-significant at the .05 level. A significant correlation coefficient (at the .01 level) was obtained between Varable B and the Verbal Factor.

Table 25 summarizes the intercorrelations among the

TABLE 24

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	.018	.227	.023	.123	.156
Variable B[g]	.131	.418**	.284	.103	.113

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

TABLE 25

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	IND	.518**	.567**	.161	.203
Variable B[g]	IND	.518**	IND	.045	.079

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

* $p < .05$.

** $p < .01$.

two measures of self-perception and the five parts of the clinic procedure when a discrepancy of 1.0 SD or more between aptitude and performance was used as the criterion for selecting underachievers by each of the five parts of the clinic procedure.

It will be observed from Table 25 that of the 10 intercorrelations among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, 3 of the correlation coefficients were indeterminate for the sample under study, 4 were non-significant at the .05 level, and 3 were significant at the .01 level. The significant coefficients were between Variable B and the Verbal Factor and between Variable A and the Verbal and Reality Factors.

Table 26 summarizes the intercorrelations among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, at a discrepancy level of 1.5 SD or more.

It will be noted from Table 26 that of the 10 intercorrelations among the two measures of self-perception and the five parts of the clinic procedure, 7 of the correlation coefficients were indeterminate for this sample and 3 were non-significant at the .05 level.

A synthesis of the preceding findings shows that when .5 SD or more and 1.0 SD or more discrepancy between the Expected Ability Quotient and the five parts of the clinic

TABLE 26

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Random Sample of 100 Sixth Grade Males

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	IND	.016	IND	.016	IND
Variable B[g]	IND	IND	IND	.232	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

procedure were used as the criteria for selecting underachievers, the intercorrelations were predominantly nonsignificant (.05 level) for a discrepancy of .5 SD or more and predominantly indeterminate (for the sample under study) for a discrepancy of 1.5 SD or more. Significant intercorrelations (.01 level) occurred between the five-part clinic procedure and the two measures of self-perception when a discrepancy of 1.0 SD or more was used by the clinic procedure as the criterion for selecting underachievers.

Discussion. The results at the 1.0 SD or more level of discrepancy indicate that there was a relationship between negative self-concept and selection of underachievers by the Verbal and Reality Factors, for the random sample of 100 sixth grade males. A relationship was also obtained between negative perception of control over environment and selection of underachievers by the Verbal Factor.

The lack of intercorrelations among the two measures of self-perception and the five-part clinic procedure, when discrepancies of .5 SD or more and 1.5 SD or more were used by the clinic procedure as criteria for underachievement, suggests that discrepancies of .5 SD and 1.5 SD between aptitude and performance may not provide appropriate criteria for selecting underachievers by the five-part clinic procedure.

Analysis II: Group of 50 Students with IQ's below 90

Question 1: Is the Probability of Selection as an Underachiever Equally Distributed across Six Objective Methods of Selecting Underachievers, Two Subjective Methods of Selecting Underachievers, and a Five-Part Clinic Procedure for Selecting Underachievers at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Performance?

The values obtained from the Cochran's Test at discrepancies between aptitude and performance of .5 SD or more, 1.0 SD or more, and 1.5 SD or more were all significant beyond the .01 level, as is shown in Table 27.

Discussion. The findings for the group with IQ's below 90 indicate that selection as an underachiever was not equally probable among the six objective methods of selecting underachievers, the two subjective methods, and the five-part clinic procedure at all three levels of discrepancy between aptitude and performance. The larger values for the 1.0 SD and 1.5 SD levels of discrepancy suggest that the size of the discrepancy between aptitude and performance may affect the interrelationships among the nine methods of selecting underachievers.

It will be recalled from Analysis I that the values obtained from the Cochran's Test for the random sample of 100 students were also significant beyond the .01 level for

TABLE 27

Values for the Cochran's Test at Three Levels of Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Sample	Levels of Discrepancy		
	.5 SD	1.0 SD	1.5 SD
Sample with IQ's below 90	59.49^{**}	92.39^{**}	179.86^{**}

$^{**}p < .01$.

all three levels of discrepancy between academic aptitude and performance.

Question 2: What Are the Interrelationships among the Six Objective Methods of Selecting Underachievers for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Performance?

Table 28 summarizes the findings for the intercorrelations among the six methods of selecting underachievers when a discrepancy of .5 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be noted from the intercorrelations reported in Table 28 that correlation coefficients significant at the .05 level were found between the following methods of selecting underachievers: (a) Method 1 and Method 4, (b) Method 2 and Method 6, (c) Method 4 and Method 5, and (d) Method 5 and Method 6. Correlation coefficients significant at the .01 level were obtained between Method 2 and Method 3 and between Method 4 and Method 1. Correlation coefficients for the following methods were non-significant at the .05 level: (a) Method 1 and Method 5; (b) Method 2 and Methods 4, 5; (c) Method 3 and Methods 4, 5, 6; (d) Method 4 and Methods 2, 3, 6; (e) Method 5 and Methods 1, 2, 3, 6; and (f) Method 6 and Methods 3, 4. The correlation coefficients between Method 1 and Methods 2, 3, and 6 were indeterminate for the sample under study.

TABLE 28

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	IND	IND	.644*	.377	IND
Method 2[b]		.892**	.145	.179	.545*
Method 3[c]			.196	.071	.424
Method 4[d]				.719*	.266
Method 5[e]					.815*
Method 6[f]					

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

Table 29 summarizes the findings for the intercorrelations among the six methods of selecting underachievers when a discrepancy of 1.0 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be observed from Table 29 that of the 15 intercorrelations among the six objective methods of selecting underachievers, 13 of the correlation coefficients were indeterminate for the sample of 50 subjects with IQ's less than 90. The other two correlation coefficients were nonsignificant at the .05 level.

Table 30 summarizes the findings for the intercorrelations among the six objective methods of selecting underachievers, when a discrepancy of 1.5 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

A reference to Table 30 will show that for a discrepancy level of 1.5 SD or more between aptitude and performance, all of the 15 correlation coefficients among the six objective methods of selecting underachievers were indeterminate for the sample of 50 sixth grade students with IQ's below 90.

Discussion. It will be recalled from Analysis I (random sample of 100 students) that for all six objective methods of selecting underachievers, when a discrepancy of

TABLE 29

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	IND	IND	IND	IND	IND
Method 2[b]		IND	IND	IND	IND
Method 3[c]			IND	IND	.584
Method 4[d]				IND	.857
Method 5[e]					IND
Method 6[f]					

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

TABLE 30

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	IND	IND	IND	IND	IND
Method 2[b]		IND	IND	IND	IND
Method 3[c]			IND	IND	IND
Method 4[d]				IND	IND
Method 5[e]					IND
Method 6[f]					

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

1.0 SD or more was used, there was a relationship between two methods of selecting underachievers when both methods used the same measures of academic aptitude. For the sample of 50 students with IQ's less than 90, some evidence of this pattern of interrelationships was evident for a discrepancy of .5 SD or more.

The results for the .5 SD level of discrepancy showed that for the 50 students with IQ's less than 90, there was a relationship between selection of underachievers by Method 2 and Methods 3 and 6 and between selection of underachievers by Method 4 and Methods 1 and 5. Thus, for these two methods of selecting underachievers which employed standardized test data to establish both academic aptitude and performance, there was a relationship between methods of selecting underachievers when both methods used the same measure to establish academic aptitude. For discrepancies of 1.0 SD or more and 1.5 SD or more, the majority of the correlation coefficients were unobtainable for a sample size of 50. The increased number of indeterminate correlation coefficients for a sample size of 50 was not unexpected because of the restricted range of the smaller sample size.

Question 3: What Is the Interrelationship between the Two Subjective Methods of Selecting Underachievers?

A correlation coefficient of .256, which was nonsignificant at the .05 level, was obtained between the two subjective methods of selecting underachievers, i.e., student judgment of achievement and teacher judgment of achievement. (Level of discrepancy between academic aptitude and academic performance was not involved in the comparison between the two subjective methods of selecting underachievers.)

Discussion. These results do not give evidence of a relationship between selection as an underachiever by student judgment of achievement and selection as an underachiever by teacher judgment of achievement, for the sample of 50 students with IQ's below 90. It will be recalled from Analysis I that there was a relationship between the two subjective methods of selecting underachievers for the random sample of 100 students. It is possible that students with low IQ's who feel that in comparison with their potential, their school achievement is "not as good as expected" may expect of themselves higher academic performance than their teachers expect of them. It is also possible that the relationship was found between the two subjective methods of selecting underachievers for the sample of Analysis I, but not for the sample of Analysis II, because of the restricted range of the sample size of 50 used in Analysis II.

Question 4: What Are the Interrelationships among the Two Subjective Methods of Selecting Underachievers and the Six Objective Methods of

Selecting Underachievers, for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 31 records the results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods of selecting underachievers for a .5 SD discrepancy or more between academic aptitude and academic performance.

A reference to Table 31 will show that, of the six correlation coefficients between Method 7 and the six objective methods of selecting underachievers, five of the coefficients were non-significant (.05 level). A significant correlation coefficient (.05 level) was obtained between Method 7 and Method 3. Of the six correlation coefficients reported in Table 31 between Method 8 and the objective methods of selecting underachievers, four coefficients were non-significant (.05 level) and two were indeterminate for the sample under study.

The results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods, at 1.0 SD discrepancy or more between aptitude and performance, are recorded in Table 32.

It will be noted from Table 32 that, of the correlation coefficients between Method 7 and each of the six objective methods of selecting underachievers, three coefficients were indeterminate for the sample under study and two

TABLE 31

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.565	.589*	.349	.069	.379	.079
Method 8[h]	IND	.354	.131	.349	IND	.234

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

TABLE 32

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.379	IND	.589*	IND	IND	.219
Method 8[h]	IND	IND	.565*	.033	IND	.251

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

were non-significant at the .05 level. The correlation coefficient between Method 7 and Method 3 was significant at the .05 level. Of the correlation coefficients reported between Method 8 and the objective methods of selecting underachievers, three were indeterminate for the sample under study, two were non-significant at the .05 level. The correlation coefficient between Method 8 and Method 3 was significant at the .05 level.

Table 33 records the results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods, when a discrepancy of 1.5 SD or more was used by each of the objective methods as the criterion for selecting underachievers.

It will be observed from Table 33 that for a discrepancy of 1.5 SD or more, five of the coefficients between Method 7 and the six objective methods of selecting underachievers were indeterminate for this sample and one coefficient was non-significant at the .05 level. All of the correlation coefficients between Method 8 and Methods 1 through 6 were indeterminate for the sample under study.

Discussion. The results presented in the preceding paragraphs show evidence of the following interrelationships among the two subjective methods of selecting underachievers and the six objective methods for the sample of 50 sixth grade boys with IQ's below 90:

1. When a discrepancy of .5 SD or more between

TABLE 33

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	IND	IND	IND	IND	IND	.066
Method 8[h]	IND	IND	IND	IND	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

academic aptitude and academic performance was used as the criterion for selection as an underachiver, the findings indicated a relationship between selection as an underachiever by student judgment of achievement and only one of the six objective methods of selecting underachievers (Method 2). With two of the correlation coefficients indeterminate for this sample, the findings did not indicate a relationship between selection as an underachiever by teacher judgment of achievement and the other three objective methods of selecting underachievers.

2. For a discrepancy of 1.0 SD or more, a relationship was found between selection as an underachiever by student judgment of achievement and Method 3 and also between selection as an underachever by teacher judgment of achievement and Method 3. Several of the correlation coefficients were indeterminate for this sample at the 1.0 SD level of discrepancy between academic aptitude and performance.

3. When a discrepancy of 1.5 SD or more was used, all but one of the 12 intercorrelations among the subjective and objective methods of selecting underachievers were indeterminate for the sample under study.

Comparison of the interrelationships among the subjective and the objective methods of selecting underachievers at each level of discrepancy is not feasible because of the large number of unobtainable correlation coefficients at the 1.0 SD and the 1.5 SD levels. It was observed, however, for the sample of 50 students with IQ's below 90, that students whose academic performance was only slightly (.5 SD) below their academic potential (as indicated by the six objective methods of selecting underachievers) tended not to select themselves as underachievers or to be selected as underachievers by their teachers.

Question 5: What Are the Interrelationships among the Five Parts of the Clinic Procedure for Selecting Underachievers, for each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 34 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when a .5 SD discrepancy or more between the Expected Ability Quotient and each factor score (see Chapter II, page 63) was used as the criterion for underachievement.

A reference to Table 34 will show that of the 10 correlation coefficients obtained, two were significant at the .05 level and eight were non-significant at the .05 level.

Table 35 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when a 1.0 SD discrepancy or more between the Expected Ability Quotient and each factor score (see Chapter II, page 63) was used as the criterion for underachievement.

A reference to Table 35 will show that of the 10

TABLE 34

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	.441*	.842*	.139	.280
V Factor[b]		.266	.098	.409
R Factor[c]			.409	.186
M Factor[d]				.294
P Factor[e]				

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

TABLE 35

Tetrachoric Correlation Coefficients Among Five Parts
of the Clinic Procedure for Selecting Underachievers
at 1.0 SD Discrepancy Between Academic Aptitude
and Performance for a Sample of
50 Sixth Grade Males with
IQ's Below 90

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	.524	.715*	.266	.645
V Factor[b]		.119	.676*	.022
R Factor[c]			.266	.645
M Factor[d]				.785
P Factor[e]				

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

correlation coefficients obtained, two were significant at the .05 level and eight were non-significant at the .05 level.

Table 36 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when a 1.5 SD discrepancy or more between the Expected Ability Quotient and each factor score was used as the criterion for underachievement.

It will be noted from Table 36 that, using a discrepancy of 1.5 SD or more between aptitude and performance, all 10 of the intercorrelations among the five parts of the clinic procedure were unobtainable for the sample of 50 sixth grade boys with IQ's below 90.

Discussion. The intercorrelations reported in Tables 30 and 31 indicate that there were interrelationships among the five parts of the clinic procedure for selecting underachievers at the .5 SD and the 1.0 SD levels of discrepancy for the sample under study. By comparing the data from Tables 11 and 12 (pages 94 and 96) and Tables 34 and 35, it will be seen that there were more interrelationships among the five parts of the clinic procedure for the random sample of 100 students than for the sample of 50 students with IQ's below 90. These findings would not be unexpected because of the restricted range of the sample of 50 as compared to the sample of 100.

TABLE 36

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	IND	IND	IND	IND
V Factor[b]		IND	IND	IND
R Factor[c]			IND	IND
M Factor[d]				IND
P Factor[e]				

Note.--IND: Interdeminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

Question 6: What Are the Interrelationships among the Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 37 summarizes the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, when a .5 SD discrepancy or more between academic aptitude and academic performance was used as the criterion for selecting underachievers.

A reference to Table 37 will show that of the 30 correlation coefficients among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, 1 was significant at the .05 level, 2 were significant at the .01 level, 4 were indeterminate for the sample under study, and 23 were non-significant at the .05 level. The correlation coefficients between the Motivational Factor and Method 2 was significant at the .05 level. The correlation coefficients between the Motivational Factor and Methods 3 and 4 were significant at the .01 level.

Table 38 summarizes the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of

TABLE 37

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	.539	.036	IND	.027	.027
Method 2[g]	.443	.354	.671	.450*	.029
Method 3[h]	.158	.236	.118	.606**	.113
Method 4[i]	.185	.113	.473	.666**	.091
Method 5[j]	IND	IND	IND	.315	.315
Method 6[k]	.085	.234	.040	.365	.293

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[g] Discrepancy between WISC and Stanford Achievement Test.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between Lorge-Thorndike and WRAT.

[j] Discrepancy between Lorge-Thorndike and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

TABLE 38

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	IND	.239	IND	.377	.311
Method 2[g]	IND	IND	IND	IND	IND
Method 3[h]	.355	IND	IND	.645	.266
Method 4[i]	.747	.607	.747	IND	.698
Method 5[j]	IND	IND	IND	IND	IND
Method 6[k]	.584	.392	.882[*]	.849[*]	.515

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[g] Discrepancy between WISC and *Stanford Achievement Test*.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between *Lorge-Thorndike* and WRAT.

[j] Discrepancy between *Lorge-Thorndike* and GPA.

[k] Discrepancy between WISC and GPA.

[*] $p < .05$.

[**] $p < .01$.

selecting underachievers, when a discrepancy of 1.0 SD or more was used as the criterion for selecting underachievers.

It will be noted from Table 38 that of the 30 intercorrelations among the five parts of the clinic procedure and the six objective methods of selecting underachievers, 15 of the correlation coefficients were indeterminate for the sample under study, 13 were non-significant at the .05 level, and 2 were significant at the .05 level. The two significant correlation coefficients were between the Reality Factor and Method 6 and between the Motivational Factor and Method 6.

Table 39 summarizes the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, when a discrepancy of 1.5 SD or more was used as the criterion for selecting underachievers.

A reference to Table 39 will show that all 30 of the correlation coefficients between the five-part clinic procedure and the objective methods of selecting underachievers were indeterminate for the sample of 50 students with IQ's below 90.

Discussion. For the sample of 50 students with IQ's below 90, the results reported at all three levels of discrepancy between academic aptitude and academic performance show evidence of only a few interrelationships at each level of discrepancy among the five parts of the clinic procedure

TABLE 39

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	IND	IND	IND	IND	IND
Method 2[g]	IND	IND	IND	IND	IND
Method 3[h]	IND	IND	IND	IND	IND
Method 4[i]	IND	IND	IND	IND	IND
Method 5[j]	IND	IND	IND	IND	IND
Method 6[k]	IND	IND	IND	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[g] Discrepancy between WISC and Stanford Achievement Test.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between Lorge-Thorndike and WRAT.

[j] Discrepancy between Lorge-Thorndike and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

and the six objective methods of selecting underachievers. When a discrepancy of .5 SD or more between academic aptitude and performance was used as the criterion for underachievement, a relationship was found between selection as an underachiever by the Motivational Factor and selection by three of the six objective methods of selecting underachievers (Methods 2, 3, and 4). At the 1.0 SD level of discrepancy, there was a relationship between selection as an underachiever by the Motivational Factor and one of the objective methods of selecting underachievers (Method 6). A relationship was also found between selection as an underachiever by the Reality Factor and Method 6. When a discrepancy of 1.5 SD or more was used as the criterion for selecting underachievers, all of the correlation coefficients were indeterminate for the sample under study.

On the basis of data obtained on a random sample of 100 sixth grade students, a question was raised in Analysis I (pages 89 and 91) as to whether the clinic procedure, as a whole, was a useful means of selecting underachievers. It was also pointed out that the adapted Jastak factors may deal with dimensions of underachievement different from the objective methods of selecting underachievers.

The lack of interrelationships between selection of underachievers by the clinic procedure and selection by the objective methods of selecting underachievers, noted in Analysis II for the sample of 50 students with IQ's below 90, likewise raises questions regarding the usefulness of the clinic procedure of selecting underachievers. It is also possible that the adapted Jastak factors and the objective methods of selecting underachievers may deal with different aspects of underachievement.

It will be noted parenthetically that in the samples of both Analysis I and Analysis II, the Motivational Factor was related to at least one of the objective methods of selecting underachievers at the .5 SD and 1.0 SD levels of discrepancy.

Question 7: What Are the Interrelationships among the Five Parts of the Clinic Procedure and the Two Subjective Methods of Selecting Underachievers, for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 40 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

It will be noted from Table 40 that 9 of the 10 correlation coefficients between the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers were non-significant at the .05 level, when a discrepancy of .5 SD or more was used as the criterion for selecting underachievers by the clinic procedure.

TABLE 40

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	.360	.376*	.086	.372	.052
Method 8[g]	.657	.185	.617	.046	.242

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

Table 41 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of 1.0 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

It will be observed from Table 41 that all 10 of the correlation coefficients between the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers were non-significant at the .05 level.

Table 42 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of 1.5 SD or more was used by the clinic procedure as the criterion for selecting underachievers.

A reference to Table 42 will show that eight of the ten correlation coefficients between the two subjective methods of selecting underachievers and the five parts of the clinic procedure were indeterminate for the sample under study. The other two correlation coefficients were non-significant at the .05 level.

Discussion. The large number of non-significant

TABLE 41

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	.106	.075	.106	.364	.071
Method 8[g]	.513	.694	.141	.266	.332

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

TABLE 42

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	IND	IND	IND	.343	IND
Method 8[g]	IND	IND	IND	.251	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, for the sample of 50 students with IQ's below 90, denote a striking lack of interrelationships among these definitions of underachievement at the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance. For a discrepancy of 1.5 SD or more with the majority of correlation coefficients indeterminate, the data were insufficient for drawing meaningful generalizations. Thus, for the sample of 50 sixth grade boys with IQ's below 90, selection as an underachiever by the five parts of the clinic procedure did not appear to be related to selection as an underachiever by student judgment of achievement or teacher judgment of achievement for the .5 SD or 1.0 SD levels of discrepancy between academic aptitude and performance.

Question 8: What Is the Relationship between the Two Measures of Self-Perception?

A correlation coefficient of .836 (significant at the .01 level) was obtained between the two measures of self-perception, *i.e.*, student academic self-concept and student perception of control over environment. (Level of discrepancy between academic aptitude and academic performance was not involved in the comparison between the two measures of self-perception.)

Discussion. These results indicate that there was a relationship between student academic self-concept and negative perception of control over environment for the sample of 50 sixth grade boys with IQ's below 90. That is to say, students who agreed with or were not sure about the statement "People like me don't have much of a chance to be successful in life" tended to have negative academic self-concepts in the sample under study. It will be recalled from Analysis I that a relationship was found between the two measures of self-perception for the random sample of 100 students.

Question 9: What Are the Interrelationships among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 43 records the intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a .5 SD discrepancy or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

It will be seen from Table 43 that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 9 of the correlation coefficients were non-significant at the .05

TABLE 43

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.027	.029	.098	.279	IND	.293
Variable B[h]	.364	.030	.011	.385	IND	.530*

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

level and 2 were indeterminate for the sample under study. The correlation coefficient between Variable B and Method 6 was significant at the .05 level.

Table 44 records the intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a 1.0 SD discrepancy or more between aptitude and performance was used as the criterion for selecting underachievers by each of the objective methods.

A reference to Table 44 will show that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 8 of the correlation coefficients were non-significant at the .05 level and 4 were indeterminate for the sample under study.

Table 45 records the intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a discrepancy of 1.5 SD or more was used by each of the objective methods as the criterion for selecting underachievers.

It will be observed from Table 45 that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 10 of the correlation coefficients were indeterminate for this sample and 2 were non-significant at the .05 level.

TABLE 44

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.145	IND	.266	.301	IND	.025
Variable B[h]	.219	IND	.106	.066	IND	.219

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

* $p < .05$.

** $p < .01$.

TABLE 45

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	IND	IND	IND	IND	IND	.301
Variable B[h]	IND	IND	IND	IND	IND	.066

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

Discussion. Summarizing the data from Tables 43, 44, and 45, it will be seen that all of the correlation coefficients between the measures of self-perception and the objective methods of selecting underachievers were either non-significant (.05 level) or indeterminate (for the sample under study) at all three levels of discrepancy between aptitude and performance for the objective methods. These data do not show evidence of a relationship between negative self-concept and academic underachievement (operationally defined by six relative discrepancy methods of selecting underachievers) for the sample of 50 sixth grade boys with IQ's below 90. A reference to the data for Question 9, Analysis I (pages 113-118) will show a similar lack of relationships between negative self-concept and the six objective methods of selecting underachievers for the random sample of 100 students as well. It was pointed out in the discussion of Question 9, Analysis I (page 118) that the findings of the present investigation may have been influenced by the manner in which scores representing negative self-concept were obtained.

The data for the relationship between Negative Perception of Control over Environment and each of the six objective methods of selecting underachievers showed only one significant relationship at the .5 SD level of discrepancy and none at the 1.0 SD level of discrepancy. The data at the 1.0 SD and 1.5 SD levels of discrepancy, with the majority of the correlation coefficients indeterminate for the sample under study, were insufficient for drawing meaningful generalizations. On the whole, these findings may be taken to indicate for the sample of 50 boys with IQ's below 90 that, students with negative perception of control over environment did not tend to be selected as underachievers by the six objective methods of selecting underachievers. That is to say, students agreeing with or not sure about the statement "People like me don't have much of a chance to be successful in life" were not generally selected as underachievers by the six objective methods of selecting underachievers.

Question 10: What Are the Interrelationships among the Two Measures of Self-Perception and the Two Subjective Methods of Selecting Underachievers?

Table 46 gives the intercorrelations among the two measures of self-perception and the two subjective methods of selecting underachievers. (Level of discrepancy between aptitude and performance was not involved in these comparisons.)

It will be seen from Table 46 that none of the correlation coefficients between the two measures of self-perception and the two subjective methods of selecting underachievers were significant at the .05 level.

TABLE 46

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Two Subjective Methods of Selecting Underachievers for a Sample of 50 Sixth Grade Males with IQ's Below 90

Measures of Self-Perception	Subjective Methods of Selecting Underachievers	
	Method 7[a]	Method 8[b]
Variable A[c]	.198	.098
Variable B[d]	.324	.366

[a] Selection of underachievers by student judgment of achievement.

[b] Selection of underachievers by teacher judgment of achievement.

[c] Student academic self-concept.

[d] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

Discussion. For the sample of 50 sixth grade boys with IQ's below 90, the data do not give evidence of interrelationships among the two measures of self-perception and the two subjective methods of selecting underachievers.

The non-significant correlation coefficients (.05 level) between Variable A and Methods 7 and 8 suggest that students with negative self-concepts did not tend to select themselves as underachievers or to be selected by their teachers as underachievers. The non-significant correlation coefficients (.05 level) between Variable B and Methods 7 and 8 indicate that students with negative perception of control over environment also did not tend to select themselves as underachievers nor to be selected by their teachers as underachievers.

In comparing these data with that of Analysis I, it will be noted that a relationship was found between Variable A and Method 7 for the random sample of 100. This relationship was not supported by the findings of Analysis II (the sample of 50 students with IQ's below 90).

Question 11: What Are the Interrelationships among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers, for Each of Three Levels of Discrepancy between Academic Aptitude and Performance?

Table 47 summarizes the intercorrelations between the two measures of self-perception and the five parts of the

TABIE 47

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	.153	.463*	.326	.371	.020
Variable B[g]	.276	.246	.173	.198	.484

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

clinic procedure for selecting underachievers, when a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by each of the five parts of the clinic procedure.

It will be seen from Table 47 that of the 10 intercorrelations among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, 9 of the 10 correlation coefficients were non-significant at the .05 level. A significant correlation coefficient (at the .05 level) was obtained between Variable A and the Verbal Factor.

Table 48 summarizes the intercorrelations among the two measures of self-perception and the five parts of the clinic procedure, when a discrepancy of 1.0 SD or more between aptitude and performance was used as the criterion for selecting underachievers by each of the five parts of the clinic procedure.

It will be observed from Table 48 that of the 10 intercorrelations among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, 2 of the correlation coefficients were indeterminate for the sample under study, 6 were non-significant at the .05 level, and 2 were significant at the .05 level. The significant correlation coefficients were between Variable A and selection of underachievers by the

TABLE 48

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	IND	.491*	.475	.358	.027
Variable B[g]	IND	.409	.106	.565*	.233

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

Verbal Factor and between Variable B and selection of underachievers by the Motivational Factor.

Table 49 summarizes the intercorrelations among the two measures of self-perception and the five parts of the clinic procedure at a discrepancy level of 1.5 SD.

It will be noted from Table 49 that all 10 of the correlation coefficients among the two measures of self-perception and the five parts of the clinic procedure were indeterminate, for the sample under study, at a discrepancy level of 1.5 SD.

A synthesis of the preceding findings shows that when a discrepancy of .5 SD or more or a discrepancy of 1.5 SD or more between the Expected Ability Quotient and the five parts of the clinic procedure was used as the criterion for selecting underachievers, the intercorrelations among the two measures of self-perception and the five parts of the clinic procedure were predominantly non-significant (.05 level) for the .5 SD level and indeterminate for the sample under study for the 1.5 SD level. Two significant correlation coefficients (.05 level) occurred, however, for a discrepancy of 1.0 SD or more between academic aptitude and performance.

Discussion. The results at the 1.0 SD level of discrepancy indicate that there was a relationship between negative self-concept and selection of underachievers by the

TABLE 49

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Below 90

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	IND	IND	IND	IND	IND
Variable B[g]	IND	IND	IND	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

Verbal Factor, for the sample of 50 sixth grade boys with IQ's below 90. A relationship was also noted between negative perception of control over environment and the selection of underachievers by the Motivational Factor.

The lack of intercorrelations among the two measures of self-perception and the five-part clinic procedure for selecting underachievers, when discrepancies of .5 SD or more and 1.0 SD or more were used by the clinic procedure as criteria for underachievement, suggests that the .5 SD and 1.5 SD discrepancy levels may not provide appropriate criteria for selecting underachievers by the clinic procedure.

Analysis III: Group of 50 Students with IQ's from 90 through 110

Question 1: Is the Probability of Selection as an Underachiever Equally Distributed across Six Objective Methods of Selecting Underachievers, Two Subjective Methods of Selecting Underachievers, and a Five-Part Clinic Procedure for Selecting Underachievers at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Performance?

The values obtained from the Cochran's Test at discrepancies of .5 SD or more, 1.0 SD or more, and 1.5 SD or more between aptitude and performance were all significant beyond the .01 level, as is shown in Table 50.

Discussion. These data indicate that selection as an underachiever was not equally probable among the six objective

TABLE 50

Values for the Cochran's Test at Three Levels of Discrepancy Between Academic Aptitude and Performance for Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Sample	Levels of Discrepancy		
	.5 SD	1.0 SD	1.5 SD
Sample with IQ's from 90 through 110	29.89**	67.23**	147.01**

$^{**}p < .01$.

methods of selecting underachievers, the two subjective methods, and the five-part clinic procedure for the group of 50 students with IQ's from 90 through 110, at all three levels of discrepancy between aptitude and performance. The larger values of the 1.0 SD and 1.5 SD discrepancy levels suggest that the size of the discrepancy between aptitude and performance may affect the interrelationships among the nine methods of selecting underachievers. It will be recalled from Analyses I and II that the values obtained from the Cochran's Test were also significant beyond the .01 level for all three levels of discrepancy for the random sample of 100 students and the sample of 50 students with IQ's below 90.

Question 2: What Are the Interrelationships among the Six Objective Methods of Selecting Underachievers for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Performance?

Table 51 summarizes the findings for the intercorrelations among the six methods of selecting underachievers when a discrepancy of .5 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be noted from the intercorrelations reported in Table 51 that correlation coefficients significant at the .01 level were found between the following methods of selecting underachievers: (a) Method 1 and Methods 4, 5, 6; (b) Method 2 and Method 6; (c) Method 3 and Method 4; (d) Method

TABLE 51

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	.271	.018	.645**	.631**	.780**
Method 2[b]		.523	.056	.185	.604**
Method 3[c]			.699**	.124	.465
Method 4[d]				.595**	.189
Method 5[e]					.780**
Method 6[f]					

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

4 and Methods 1, 3, 5; (e) Method 5 and Methods 1, 4, 6; and (f) Method 6 and Methods 1, 2, 5. Correlation coefficients for the following methods were non-significant at the .05 level: (a) Method 1 and Methods 2, 3; (b) Method 2 and Methods 1, 3, 4, 5; (c) Method 3 and Methods 1, 2, 5, 6; (d) Method 4 and Methods 2, 6; (e) Method 5 and Methods 2, 3; and (f) Method 6 and Methods 3, 4.

Table 52 summarizes the findings for the intercorrelations among the six methods of selecting underachievers when a discrepancy of 1.0 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be seen from Table 52 that of the 15 intercorrelations among the six objective methods of selecting underachievers, 6 of the correlation coefficients were indeterminate, 4 correlation coefficients were non-significant at the .05 level, 4 coefficients were significant at the .05 level, and 1 coefficient was significant at the .01 level. The correlation coefficients significant at the .05 level were between Methods 2 and 3, Methods 1 and 5, and Methods 3 and 6. The correlation coefficient significant at the .01 level was between Method 2 and Method 6.

Table 53 summarizes the findings for the intercorrelations among the six objective methods of selecting underachievers, when a discrepancy of 1.5 SD or more between

TABLE 52

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	.278	.451	IND	.664*	IND
Method 2[b]		.638*	IND	IND	.824**
Method 3[c]			.123	.286	.688*
Method 4[d]				.918*	IND
Method 5[e]					IND
Method 6[f]					

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

TABLE 53

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	IND	IND	IND	IND	IND
Method 2[b]		IND	IND	IND	.956*
Method 3[c]			IND	IND	IND
Method 4[d]				IND	IND
Method 5[e]					IND
Method 6[f]					

Note.--IND: Indeterminate correlation coefficients for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

aptitude and performance was used as the criterion for selecting underachievers.

A reference to Table 53 will show that for a discrepancy of 1.5 SD or more between academic aptitude and performance, 14 of the 15 correlation coefficients among the six objective methods of selecting underachievers were indeterminate and one was significant at the .05 level.

Discussion. It will be recalled from Analysis I (random sample of 100 sixth grade males) that for all six objective methods of selecting underachievers, when a discrepancy of 1.0 SD or more was used, there was a relationship between two methods of selecting underachievers when both methods used the same measure of academic aptitude. For a discrepancy of .5 SD or more, there was a relationship between two methods of selecting underachievers when both methods used either the same measure of academic aptitude or the same measure of academic performance. Some evidence of these patterns was also evident for the sample of 50 sixth grade males with IQ's from 90 through 110.

The results for a discrepancy of .5 SD or more between aptitude and performance showed that for the 50 students with IQ's from 90 through 110, there was a relationship between selection of underachievers by Method 4 and Methods 1, 3, 5 and between selection of underachievers by Method 5 and Methods 1, 4, 6. Thus, with reference to

Methods 4 and 5, relationships between these methods and each of the other six methods occurred when two methods employed either the same measure of academic aptitude or the same measure of academic performance.

The results for a discrepancy of 1.0 SD or more for this sample showed that there was a relationship between selection of underachievers by Method 2 and Methods 3, 6, between selection of underachievers by Method 3 and Methods 2, 6, between selection of underachievers by Method 6 and Methods 2, 3, and between selection of underachievers by Method 5 and Methods 1, 4. Thus, for the methods in question, a relationship occurred when two methods employed the same measure of academic aptitude.

The findings for the 1.5 SD level of discrepancy, with all but one of the intercorrelations unobtainable for this sample, suggest that a discrepancy of 1.5 SD or more is too large to permit comparisons among these methods of selecting underachievers in a sample of 50 subjects.

Question 3: What Is the Interrelationship between the Two Subjective Methods of Selecting Underachievers?

A correlation coefficient of .105, which was nonsignificant at the .05 level, was obtained between the two subjective methods of selecting underachievers, *i.e.*, student judgment of achievement and teacher judgment of achievement. (Level of discrepancy between academic aptitude and academic performance was not involved in the comparison between the two subjective methods of selecting underachievers.)

Discussion. These results do not give evidence of a relationship between selection as an underachiever by student judgment of achievement and selection as an underachiever by teacher judgment of achievement for the sample of 50 sixth grade boys with IQ's from 90 through 110. It will be recalled from Analyses I and II that there was a relationship between the two subjective methods of selecting underachievers for the random sample of 100 students, but not for the sample of 50 students with IQ's below 90. It is possible that students with low or average IQ's, who feel that in comparison with their potential, their school achievement is "not as good as expected," may expect of themselves higher academic performance than their teachers expect of them. It is also possible that a relationship was found between the two subjective methods of selecting underachievers for the sample of Analysis I but not for the samples of Analyses II and III because of the restricted range of the sample size of 50 used in Analyses II and III.

Question 4: What Are the Interrelationships among the Two Subjective Methods of Selecting Underachievers and the Six Objective Methods for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 54 records the results for the intercorrelations

TABLE 54

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.029	.209	.113	.113	.209	.089
Method 8[h]	.165	.166	.363	.253	.416*	.372

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

among the two subjective methods of selecting underachievers and the six objective methods when a discrepancy of .5 SD or more between aptitude and performance was used by each of the objective methods as a criterion for selecting underachievers.

A reference to Table 54 will show that all six of the correlation coefficients between Method 7 and the objective methods of selecting underachievers were non-significant at the .05 level. Of the six correlation coefficients between Method 8 and the objective methods of selecting underachievers, five of the coefficients were non-significant at the .05 level. A correlation coefficient significant at the .05 level was obtained between Method 8 and Method 5.

The results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods, at 1.0 SD discrepancy or more between aptitude and performance, are recorded in Table 55.

It will be noted from Table 55 that all of the correlation coefficients between Method 7 and Methods 1 through 6 were non-significant at the .05 level. Of the six correlation coefficients between Method 8 and the objective methods of selecting underachievers, one was significant at the .01 level, four were non-significant at the .05 level, and one was indeterminate for the sample under study.

Table 56 records the results for the intercorrelations among the two subjective methods of selecting underachievers

TABLE 55

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.209	.227	.000	.172	.432	.227
Method 8[h]	.083	.058	.639**	.492	IND	.058

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

TABLE 56

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.286	IND	IND	IND	IND	IND
Method 8[h]	.379	.343	IND	IND	IND	.219

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

and the six objective methods, when 1.5 SD discrepancy or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

It will be noted from Table 56 that five of the correlation coefficients between Method 7 and Methods 1 through 6 were indeterminate for this sample and one was non-significant at the .05 level. Of the six correlation coefficients between Method 8 and Methods 1 through 6, three were indeterminate for the sample under study and three were non-significant at the .05 level.

Discussion. The results recorded in Tables 54 and 55 show evidence of a striking lack of interrelationships among the two subjective methods of selecting underachievers and the six objective methods for the sample of 50 sixth grade males with IQ's from 90 through 110. The data for a discrepancy of 1.5 SD or more, with the majority of the correlation coefficients unobtainable, were insufficient for drawing meaningful generalizations.

For this sample, the data did not indicate a relationship between selection of underachievers by student judgment of achievement and any of the six objective methods of selecting underachievers for discrepancies of .5 SD or 1.0 SD between aptitude and performance. A relationship between selection of underachievers by teacher judgment of achievement and Method 5 was observed for a discrepancy of .5 SD or more, and between selection of underachievers by teacher judgment of achievement and Method 3 for a discrepancy of 1.0 SD or more.

A question was raised in Analysis I (random sample of 100 sixth grade males) regarding the criterion by which students and teachers selected underachievers in the present investigation. The lack of interrelationships between the two subjective methods and the six objective methods for the sample of 50 students with IQ's below 90 and the sample of 50 students with IQ's from 90 through 110 suggest that, for these samples, the criterion by which students and teachers judged underachievement may have been based on a criterion or criteria other than the one requested, *i.e.*, discrepancy between aptitude and performance.

Question 5: What Are the Interrelationships among the Five Parts of the Clinic Procedure for Selecting Underachievers, for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 57 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when .5 SD discrepancy or more between the Expected Ability Quotient and each factor score (Chapter II, page 63) was used as the criterion for underachievement.

A reference to Table 57 will show that of the 10

TABLE 57

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	.422	.522*	.009	.694**
V Factor[b]		.086	.631**	.468*
R Factor[c]			.184	.375
M Factor[d]				.683**
P Factor[e]				

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

correlation coefficients obtained, 2 were significant at the .05 level, and 3 were significant at the .01 level. Five of the 10 coefficients were non-significant at the .05 level.

The intercorrelations among the five parts of the clinic procedure for selecting underachievers, when a discrepancy of 1.0 SD or more was used, are summarized in Table 58.

It will be seen from Table 58 that among the 10 intercorrelations, 4 were indeterminate for the sample under study, 1 was significant at the .05 level, 1 was significant at the .01 level, and 4 were non-significant at the .05 level.

Table 59 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when 1.5 SD discrepancy or more between academic aptitude and performance was used as the criterion for underachievement.

It will be seen from Table 59 that all 10 of the correlation coefficients among the five parts of the clinic procedure for selecting underachievers were indeterminate for the sample under study, when a discrepancy of 1.5 SD or more was used as the criterion for selecting underachievers.

Discussion. The intercorrelations reported in Tables 57 and 58 indicate, for the sample of 50 sixth grade males with IQ's from 90 through 110, that there were a number of interrelationships among the five parts of the clinic

TABLE 58

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	IND	IND	IND	IND
V Factor[b]		.309	.424	.545*
R Factor[c]			.357	.255
M Factor[d]				.793**
P Factor[e]				

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

TABLE 59

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

The Clinic Procedure	The Clinic Procedure			
	GA Factor	V Factor	R Factor	M Factor
GA Factor[a]	IND	IND	IND	IND
V Factor[b]		IND	IND	IND
R Factor[c]			IND	IND
M Factor[d]				IND
P Factor[e]				

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

procedure of selecting underachievers for the .5 SD and 1.0 SD levels of discrepancy. For a discrepancy of 1.5 SD or more between aptitude and performance, all of the intercorrelations among the five parts of the clinic procedure were indeterminate for the sample under study.

By comparing the data for Question 5 in Analyses I, II, and III at the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance, it will be seen that there were interrelationships among the five parts of the clinic procedure for each sample or Analysis at both levels of discrepancy. In view of these interrelationships among scores based on the discrepancy between Expected Ability Quotient and Factor scores, a question has been raised regarding the possibility of interrelationships among the factor scores themselves (see Analysis I, Question 5).

Question 6: What Are the Interrelationships among the Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers, at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 60 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, when a .5 SD discrepancy or more between aptitude and performance was used as the criterion for selecting underachievers.

TABLE 60

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	.211	.473*	.358	.074	.069
Method 2[g]	.098	.364	.753	.364	.167
Method 3[h]	.169	.409*	.270	.738**	.429*
Method 4[i]	.169	.281	.165	.281	.270
Method 5[j]	.401	.277	.298	.049	.298
Method 6[k]	.542	.153	.327	.541**	.012

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[g] Discrepancy between WISC and *Stanford Achievement Test*.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between *Lorge-Thorndike* and WRAT.

[j] Discrepancy between *Lorge-Thorndike* and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

A reference to Table 60 will show that of the 30 correlation coefficients among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, 3 of the coefficients were significant at the .05 level, 2 were significant at the .01 level, and 25 were non-significant at the .05 level. The correlation coefficients significant at the .05 level were between Method 3 and the Verbal and Psychomotor Factors and between Method 1 and the Verbal Factor. The correlation coefficients significant at the .01 level were between the Motivational Factor and Methods 3 and 6. None of the correlation coefficients between the General Ability Factor and the six objective methods was significant at the .05 level; none of the correlation coefficients between the Reality Factor and the six objective methods was significant at the .05 level.

Table 61 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, when a discrepancy of 1.0 SD or more between academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be noted from Table 61 that of the 30 intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods, 10 of the coefficients were indeterminate for the sample under study, 4 were significant at the .05 level, 2 were

TABLE 61

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	IND	.152	.223	.087	.401
Method 2[g]	IND	.217	IND	.438	.277
Method 3[h]	IND	.483*	.309	.924**	.829**
Method 4[i]	IND	.550	.179	.791*	.179
Method 5[j]	IND	.286	IND	.694*	IND
Method 6[k]	IND	.217	IND	.438	.543*

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[g] Discrepancy between WISC and *Stanford Achievement Test*.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between *Lorge-Thorndike* and WRAT.

[j] Discrepancy between *Lorge-Thorndike* and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

significant at the .01 level, and 14 were non-significant at the .05 level. Correlation coefficients significant at the .05 level were between the Verbal Factor and Method 3, the Motivational Factor and Methods 4, 5 and the Psychomotor Factor and Method 6. Correlation coefficients significant at the .01 level were obtained between Method 3 and the Motivational and Psychomotor Factors.

Table 62 summarizes the intercorrelations among the five parts of the clinic procedure and the six objective methods of selecting underachievers for a discrepancy of 1.5 SD or more between aptitude and performance.

A reference to Table 62 will show that of the 30 intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, 27 correlation coefficients were indeterminate for the sample under study. The other 3 correlation coefficients were non-significant at the .05 level.

Discussion. For the sample of 50 students with IQ's from 90 through 110, the results reported at the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance, showed evidence of only a few interrelationships among the five parts of the clinic procedure and the objective methods of selecting underachievers. The data for a discrepancy of 1.5 SD or more, with the majority of the correlations

TABLE 62

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	IND	IND	IND	IND	IND
Method 2[g]	IND	.857	IND	.757	IND
Method 3[h]	IND	IND	IND	IND	IND
Method 4[i]	IND	IND	IND	IND	IND
Method 5[j]	IND	IND	IND	IND	IND
Method 6[k]	IND	.857	IND	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[g] Discrepancy between WISC and Stanford Achievement Test.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between Lorge-Thorndike and WRAT.

[j] Discrepancy between Lorge-Thorndike and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

indeterminate for this sample, were insufficient for drawing meaningful generalizations.

When a discrepancy of .5 SD or more was used, a relationship was found between the Motivational Factor and Methods 3, 6; between the Verbal Factor and Methods 1, 3; and between the Psychomotor Factor and Method 3. The General Ability Factor and the Reality Factor did not appear to be related to any of the objective methods of selecting underachievers. At the 1.0 SD level of discrepancy between aptitude and performance, there was a relationship between the Motivational Factor and Methods 3, 4, and 5; between the Psychomotor Factor and Methods 3 and 6; and between the Verbal Factor and Method 3.

It will be observed from the preceding paragraph that the Motivational Factor, the Verbal Factor, and the Psychomotor Factor were all related to Method 3 at both the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance. A similar observation was recorded for Analysis I, a random sample of 100 sixth grade males, where it was pointed out that Method 3 and the adapted Jastak procedure employed the same instruments. The trend just described was not so clearly evident for Analysis II, the sample of 50 students with IQ's below 90.

On the basis of the data obtained in the previous two Analyses, a question was raised as to whether the clinic procedure, as a whole, was useful as a method of selecting underachievers. It was also pointed out that the factor discrepancy scores may deal with dimensions of underachievement different from the objective methods of selecting underachievers.

The lack of interrelationships among selection of underachievers by the clinic procedure and the objective methods of selecting underachievers, for the present sample, supports the possibility that the adapted Jastak factors may not be useful indicators of underachievement or may deal with different aspects of underachievement. It will be noted, however, that in the samples of Analyses I, II, and III, the Motivational Factor was related to at least one of the objective methods of selecting underachievers at the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance.

Question 7: What Are the Interrelationships among the Five Parts of the Clinic Procedure and the Two Subjective Methods of Selecting Underachievers at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 63 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of .5 SD or

TABLE 63

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	.087	.168	.055	.158	.055
Method 8[g]	.182	.238	.035	.476	.427*

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

It will be noted from Table 63 that 9 of the 10 correlation coefficients among the two subjective methods of selecting underachievers and the five parts of the clinic procedure were non-significant at the .05 level. The correlation coefficient between the Psychomotor Factor and Method 8 was significant at the .05 level.

Table 64 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of 1.0 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

A reference to Table 64 will show that of the intercorrelations between the five parts of the clinic procedure for selecting underachievers and Method 7, four of the coefficients were non-significant at the .05 level and one was indeterminate for the sample under study.

It can also be seen from Table 64 that of the correlations between the five parts of the clinic procedure and Method 8, two of the coefficients were non-significant at the .05 level, one was indeterminate for the sample under study, one was significant at the .05 level and one was

TABLE 64

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	IND	.384	.087	.291	.087
Method 8[g]	IND	.272	.248	.683**	.589*

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

significant at the .01 level. The correlation coefficient between Method 8 and the Motivational Factor was significant at the .01 level and the coefficient between Method 8 and the Psychomotor Factor was significant at the .05 level.

Table 65 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of 1.5 SD or more between aptitude and performance was used by the clinic procedure as the criterion for selecting underachievers.

A reference to Table 65 will show that when a discrepancy of 1.5 SD or more was used, seven of the correlation coefficients between the two subjective methods of selecting underachievers and the five parts of the clinic procedure were indeterminate for the sample under study. The other three correlation coefficients were non-significant at the .05 level.

Discussion. The results reported at the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance show evidence of only a few interrelationships among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers for the sample of 50 sixth grade males with IQ's from 90 through 110. For a discrepancy of 1.5 SD or more, with the majority of the correlation coefficients

TABLE 65

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	IND	IND	IND	.119	IND
Method 8[g]	IND	.066	IND	.219	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

indeterminate for this sample, the data were insufficient for drawing meaningful generalizations.

At the .5 SD level of discrepancy, the findings did not show evidence of a relationship between selection of underachievers by student judgment of achievement and any of the five parts of the clinic procedure for selecting underachievers. A relationship was found between selection of underachievers by teacher judgment of achievement and the Psychomotor Factor.

When a discrepancy of 1.0 SD or more was used, a relationship was not observed between selection as an underachiever by student judgment or achievement and any of the five parts of the clinic procedure. There was a relationship, however, between selection as an underachiever by teacher judgment of achievement and the Motivational and Psychomotor Factors.

Question 8: What Is the Relationship between the Two Measures of Self-Perception?

A correlation coefficient of .608, which was significant at the .01 level, was obtained between the two measures of self-perception, i.e., student academic self-concept and student perception of control over environment. (Level of discrepancy between academic aptitude and academic performance was not involved in the comparison between the two measures of self-perception.)

Discussion. These results indicate that there was a relationship between student academic self-concept and negative perception of control over environment for the sample of 50 sixth grade males with IQ's from 90 through 110.

It will be recalled from Analyses I and II that a relationship was also found between the two measures of self-perception for the random sample of 100 students and the sample of 50 students with IQ's below 90.

Question 9: What Are the Interrelationships among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 66 records the results for the intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a .5 SD discrepancy or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

It will be seen from Table 66 that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 11 of the correlation coefficients were non-significant at the .05 level. The correlation coefficient between student academic self-concept and Method 2 was significant at the .01 level.

TABLE 66

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.301	.284	.316	.223	.041	.329
Variable B[h]	.358	.616**	.165	.301	.252	.283

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

Table 67 records the results for the intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a 1.0 SD discrepancy or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

A reference to Table 67 will show that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 10 of the correlation coefficients were non-significant at the .05 level, one was indeterminate for the sample under study, and one was significant at the .05 level. The significant correlation coefficient was between Variable B and Method 1.

Table 68 records the results for the intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a 1.5 SD discrepancy or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

It will be observed from Table 68 that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 5 of the correlation coefficients were non-significant at the .05 level, 6 were indeterminate for the sample under study,

TABLE 67

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepency Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.131	.166	.234	.465	IND	.166
Variable B[h]	.412*	.345	.239	.207	.461	.092

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

TABLE 68

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.409	.251	IND	IND	IND	.313
Variable B[h]	.596*	.085	IND	IND	IND	.085

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

* $p < .05$.

** $p < .01$.

and 1 was significant at the .05 level. The significant correlation coefficient was between Variable B and Method 1.

Discussion. Summarizing the data for Variable A from Tables 66, 67, and 68, it will be seen that all of the correlation coefficients between Variable A and Methods 1 through 6 were either non-significant (.05 level) or indeterminate for the sample under study for all three levels of discrepancy between academic aptitude and performance. Thus, these data do not show evidence of a relationship between negative self-concept and academic underachievement (operationally defined by the six relative discrepancy methods of selecting underachievers) for the sample of 50 sixth grade males with IQ's from 90 through 110. A reference to the discussion for Question 9, Analyses I and II will show a similar lack of relationshipsbetween negative self-concept and the six objective methods of selecting underachievers for both the random sample of 100 students and the 50 students with IQ's below 90. It was previously pointed out in the discussion of Question 9, Analysis I, that the findings of the present investigation may have been influenced by the manner in which the scores representing negative self-concept were obtained.

The data for Variable B gave evidence of only one significant correlation coefficient (.05 or .01 levels) between Variable B and Methods 1 through 6 at each of the three levels of discrepancy between aptitude and performance.

At a discrepancy of .5 SD or more, the results indicated a relationship between negative perception of control over environment and selection of underachievers by Method 2. For a discrepancy of 1.0 SD or more, the findings indicated a relationship between negative perception of control over environment and selection of underachievers by Method 1. At a discrepancy of 1.5 SD or more, with several of the correlation coefficients indeterminate for the sample under study, there was a relationship between negative perception of control over environment and Method 1. On the whole, students in this sample agreeing with or not sure about the statement "People like me don't have much of a chance to be successful in life" were not generally selected as underachievers by the six objective methods of selecting underachievers.

Question 10: What Are the Interrelationships among the Two Measures of Self-Perception and the Two Subjective Methods of Selecting Underachievers?

Table 69 gives the results for the intercorrelations among the two measures of self-perception and the two subjective methods of selecting underachievers. (Level of discrepancy between aptitude and performance was not involved in these comparisons.)

It will be seen from Table 69 that there was a significant correlation coefficient (.01 level) between Variable B

TABLE 69

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Two Subjective Methods of Selecting Underachievers for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Measures of Self-Perception	Subjective Methods of Selecting Underachievers	
	Method 7[a]	Method 8[b]
Variable A[c]	.309	.121
Variable B[d]	.561**	.099

[a] Selection of underachievers by student judgment of achievement.

[b] Selection of underachievers by teacher judgment of achievement.

[c] Student academic self-concept.

[d] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

and Method 7. The other three correlation coefficients between the two measures of self-perception and the subjective methods of selecting underachievers were non-significant at the .05 level.

Discussion. For the sample of 50 sixth grade males with IQ's from 90 through 110, there was a relationship between Variable B and Method 7, but not between Variable B and Method 8. Students agreeing with or not sure about the statement "People like me don't have much of a chance to be successful in life" tended to select themselves as underachievers, but were not selected by their teachers as underachievers. The findings for Variable B are similar to those reported for the random sample of 100 students (Analysis I, Question 10) in which there was a relationship between the two measures of self-perception and Method 7, but not between the two measures of self-perception and Method 8. These data for Analyses I and III may be interpreted to suggest that the individual psychological characteristics of both teacher and child may have some influence on perception of academic achievement.

The non-significant correlation coefficients (.05 level) between Variable A and Methods 7 and 8 suggest that students with negative self-concepts did not select themselves as underachievers and were not selected as underachievers by their teachers in the sample of 50 students with IQ's from 90 through 110. It will be recalled from the discussion of Question 9 in the present Analysis, that the results gave no evidence of any relationships between negative self-concept and the six objective methods of selecting underachievers at all three levels of discrepancy between academic aptitude and performance. The results for Analyses I and II (random sample of 100 sixth grade males, and sample of 50 sixth grade males with IQ's below 90) also gave evidence of a general lack of relationships between Variable A and Methods 1 through 8. These findings call attention to the possibility originally raised in the discussion of Question 9, Analysis I, that the findings of the present investigation may have been influenced by the manner in which scores representing negative self-concept were obtained.

Question 11: What Are the Interrelationships among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers, at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 70 summarizes the intercorrelations between the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers when a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for underachievement by each of the five parts of the clinic procedure.

TABLE 70

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	.068	.168	.281	.056	.117
Variable B[g]	.097	.346	.461	.049	.174

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

It will be seen from Table 70 that all 10 of the correlation coefficients among the two measures of self-perception and the five parts of the clinic procedure were non-significant at the .05 level.

Table 71 summarizes the intercorrelations among the two measures of self-perception and the five-part clinic procedure, when a discrepancy of 1.0 SD or more was used as the criterion for selecting underachievers by the clinic procedure.

It will be observed from Table 71 that of the 10 intercorrelations among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, 3 of the correlation coefficients were indeterminate for the sample under study, 3 were non-significant at the .05 level, 3 were significant at the .05 level, and 1 was significant at the .01 level. The significant correlation coefficient at the .01 level was between Variable A and the Verbal Factor. Correlation coefficients significant at the .05 level were between Variable A and the Reality and Motivational Factors and between Variable B and the Verbal Factor.

Table 72 summarizes the findings for the intercorrelations among the two measures of self-perception and the five-part clinic procedure for a discrepancy of 1.5 SD or more between aptitude and performance.

TABLE 71

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	IND	.613**	.504*	.487*	.144
Variable B[g]	IND	.588*	IND	.155	.128

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

TABLE 72

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's from 90 Through 110

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	IND	.033	IND	.313	IND
Variable B[g]	IND	IND	IND	.085	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

It will be noted from Table 72 that of the 10 intercorrelations among the two measures of self-perception and the five parts of the clinic procedure, 7 of the correlation coefficients were indeterminate for this sample and 3 were non-significant for the sample under study.

A synthesis of the preceding findings shows that when .5 SD and 1.5 SD discrepancy between the Expected Ability Quotient and the five parts of the clinic procedure were used as the criteria for selecting underachievers, the intercorrelations were non-significant (.05 level) for a discrepancy of .5 SD and predominantly indeterminate (for the sample under study) for a discrepancy of 1.5 SD. Significant intercorrelations (.05 or .01 levels) occurred between the five-part clinic procedure and the two measures of self-perception only when a discrepancy of 1.0 SD was used by the clinic procedure as the criterion for selecting underachievers.

Discussion. The results at the 1.0 SD level of discrepancy indicate that there was a relationship between negative self-concept and selection of underachievers by the Verbal, Reality, and Motivational Factors for the sample of 50 sixth grade males with IQ's from 90 through 110. A relationship was also obtained between negative perception of control over environment and the Verbal Factor.

The interrelationships reported in the preceding paragraph are similar to those reported in the discussion of Question 11, Analysis I. It was pointed out in Analysis I that the lack of intercorrelations among the two measures of self-perception and the five parts of the clinic procedure, when discrepancies of .5 SD or more and 1.5 SD or more were used by the clinic procedure as criteria for underachievement, suggests that the .5 SD and 1.5 SD levels of discrepancy between aptitude and performance may not provide appropriate criteria for selecting underachievers by the five-part clinic procedure.

Analysis IV: Group of 50 Students with IQ's above 110

Question 1: Is the Probability of Selection as an Underachiever Equally Distributed across Six Objective Methods of Selecting Underachievers, Two Subjective Methods of Selecting Underachievers, and a Five-Part Clinic Procedure for Selecting Underachievers, for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

The values obtained from the Cochran's Test at discrepancies of .5 SD or more, 1.0 SD or more, and 1.5 SD or more between aptitude and performance were all significant beyond the .01 level, as is shown in Table 73.

Discussion. The statistics from Table 73 indicate that selection as an underachiever was not equally probable among the six objective methods of selecting underachievers,

TABLE 73

Values for the Cochran's Test at Three Levels of Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Sample	Levels of Discrepancy		
	.5 SD	1.0 SD	1.5 SD
Sample with IQ's above 110	76.30**	77.07**	148.29**

**$p < .01$.

the two subjective methods, and the five-part clinic procedure for the group of 50 students with IQ's above 110, at all three levels of discrepancy between aptitude and performance. The larger values for the 1.0 SD and 1.5 SD discrepancy levels suggest that the size of the discrepancy between aptitude and performance may affect the interrelationships among the nine methods of selecting underachievers. It will be recalled from Analyses I, II, and III that the values obtained from the Cochran's Test were also significant at the .01 level for all three levels of discrepancy for the random sample of sixth grade males, for the sample of 50 sixth grade males with IQ's below 90, and for the sample of 50 sixth grade males with IQ's from 90 through 110.

Question 2: What Are the Interrelationships among the Six Objective Methods of Selecting Underachievers for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 74 summarizes the findings for the intercorrelations among the six objective methods of selecting underachievers when a discrepancy of .5 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be seen from the intercorrelations reported in Table 74 that correlation coefficients significant at the .05 level were found between Method 1 and Method 3, between Method 2 and Method 3, and between Method 4 and Method 5.

TABLE 74

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	.359	.415*	.715**	.663**	.288
Method 2[b]		.395*	.026	.252	.751**
Method 3[c]			.562**	.015	.533**
Method 4[d]				.524*	.234
Method 5[e]					.266
Method 6[f]					

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

Correlation coefficients significant at the .01 level were found between Method 1 and Methods 4 and 5, between Method 2 and Method 6, and between Method 3 and Methods 4, 6. Correlation coefficients between the following methods of selecting underachievers were non-significant at the .05 level: (a) Method 1 and Methods 2, 6; (b) Method 2 and Methods 1, 4, 5; (c) Method 3 and Method 5; (d) Method 4 and Methods 2, 6; (e) Method 5 and Methods 2, 3, 6; and (f) Method 6 and Methods 1, 4, 5.

Table 75 summarizes the findings for the intercorrelations among the six objective methods of selecting underachievers when a discrepancy of 1.0 SD or more between measures of academic aptitude and academic performance was used as the criterion for selecting underachievers.

It will be noted from the intercorrelations reported in Table 75 that a correlation coefficient significant at the .05 level was obtained between Method 1 and Method 2. Correlation coefficients significant at the .01 level were found between Method 1 and Method 4 and between Method 3 and Method 6. Correlation coefficients for the following methods were non-significant at the .05 level: (a) Method 1 and Methods 3, 5, 6; (b) Method 2 and Methods 3, 4, 5, 6; (c) Method 3 and Methods 1, 2, 4, 5; (d) Method 4 and Methods 2, 5, 6; (e) Method 5 and Methods 1, 2, 3, 4; and (f) Method 6 and Methods 1, 2, 4. The correlation coefficient between

TABLE 75

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	.518*	.385	.846**	.468	.426
Method 2[b]		.346	.266	.239	.301
Method 3[c]			.346	.315	.667**
Method 4[d]				.239	.301
Method 5[e]					IND
Method 6[f]					

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

Method 5 and Method 6 was indeterminate for the sample under study.

Table 76 summarizes the findings for the intercorrelations among the six objective methods of selecting underachievers when a discrepancy of 1.5 SD or more between measures of academic aptitude and performance was used as the criterion for selecting underachievers.

It will be seen from Table 76 that of the 15 correlations obtained at 1.5 SD discrepancy, 12 of the 15 coefficients were unobtainable for the sample under study. The correlation coefficients between Methods 3 and Methods 1 and 4 were non-significant at the .05 level. The correlation coefficient between Method 1 and Method 4 was significant at the .05 level.

Discussion. The data reported for the sample of 50 sixth grade males with IQ's above 110, at discrepancies of .5 SD or more and 1.0 SD or more between aptitude and performance, gave evidence of a number of interrelationships among the six objective methods of selecting underachievers at both levels of discrepancy.

When a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for selecting underachievers, the following interrelationships were noted among the six objective methods of selecting underachievers: (a) Method 1 and Methods 3, 4, 5; (b) Method 2 and Methods 3,

TABLE 76

Tetrachoric Correlation Coefficients Among Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Objective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers				
	Method 2	Method 3	Method 4	Method 5	Method 6
Method 1[a]	IND	.189	.803*	IND	IND
Method 2[b]		IND	IND	IND	IND
Method 3[c]			.715	IND	IND
Method 4[d]				IND	IND
Method 5[e]					IND
Method 6[f]					

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

6; (c) Method 3 and Methods 1, 2, 4, 6; (d) Method 4 and Methods 1, 3; (e) Method 5 and Methods 1, 4; and (f) Method 6 and Methods 2, 3. A trend, which was similar to that discussed in relation to Question 2, Analyses I, II, and III, was likewise observed among the interrelationships observed among the objective methods of selecting underachievers in the present analysis. That is, selection of underachievers by Methods 2, 3, and 6 were significantly related only to selection by those methods using identical measures of academic aptitude. Selection of underachievers by Method 4 was significantly related to selection by methods which used either the same aptitude measure or the same performance measure.

When a discrepancy of 1.0 SD or more between aptitude and performance was used as a criterion for selecting underachievers, the following interrelationships were observed among the objective methods of selecting underachievers: (a) Method 1 and Methods 2, 4; (b) Method 2 and Method 1; (c) Method 3 and Method 6; (d) Method 4 and Method 1; and (e) Method 6 and Method 3. These interrelationships, at 1.0 SD discrepancy, for the sample with IQ's above 110, differ markedly from those reported for the samples of Analyses I, II, and III. For the students with IQ's above 110, it was noted that selection of underachievers by Methods 1 and 2 tended to be related to selection by other methods using standardized test data to establish academic performance, but not to be related to methods using grade point average to establish academic performance. Selection of underachievers by Method 3, which employed individual test data only, was related only to Method 6, which used grade point average to establish academic performance. Selection of underachievers by Method 5, which used grade point average, was not related to selection of underachievers by any other method. Selection of underachievers by Method 6, which also used grade point average, was related only to Method 3.

The findings for the 1.5 SD level of discrepancy, with the majority of the correlation coefficients indeterminate for this sample, suggest that a discrepancy of 1.5 SD or more is too large to permit comparisons among these methods of selecting underachievers in a sample size of 50 students.

Question 3: What Is the Interrelationship between the Two Subjective Methods of Selecting Underachievers?

A correlation coefficient of .374, which was significant at the .05 level, was obtained between the two subjective methods of selecting underachievers, *i.e.* student judgment of achievement and teacher judgment of achievement. (Level of discrepancy between academic aptitude and academic performance was not involved in the comparison between the two subjective methods of selecting underachievers.)

Discussion. These results indicate that there was a relationship between selection as an underachiever by student judgment of achievement and selection as an underachiever by teacher judgment of achievement for the sample of 50 sixth grade males with IQ's above 110.

It will be recalled from Analyses I, II, and III, that there was a relationship between the two subjective methods for the random sample of 100 students, but not for the sample of students with IQ's below 90 or the sample of students with IQ's from 90 through 110.

Question 4: What Are the Interrelationships among the Two Subjective Methods of Selecting Underachievers and the Six Objective Methods of Selecting Underachievers, for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 77 records the results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods of selecting underachievers when a .5 SD discrepancy or more between academic aptitude and academic performance was used by each of the objective methods as a criterion for selecting underachievers.

A reference to Table 77 will show that the correlation coefficients between Method 7 and Methods 3 and 6 were significant at the .05 level. The correlation coefficient between Method 8 and Method 5 was significant at the .05 level. The correlation coefficient between Method 8 and

TABLE 77

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.158	.113	.492*	.027	.292	.392*
Method 8[h]	.259	.311	.209	.000	.509*	.734**

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

and Method 6 was significant at the .01 level. Significant correlation coefficients were not found between Method 7 and Methods 1, 2, 4, and 5, and between Method 8 and Methods 1, 2, 3, and 4.

The results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods, at a discrepancy of 1.0 SD or more between aptitude and performance, are recorded in Table 78.

A reference to Table 78 will show that the correlation coefficients between Method 7 and Methods 5 and 6 were significant at the .05 level. The correlation coefficient between Method 8 and Method 3 was significant at the .01 level. Significant correlation coefficients were not found between Method 7 and Methods 1, 2, 4, and between Method 8 and Methods 1, 2, 4, 5, 6.

Table 79 records the results for the intercorrelations among the two subjective methods of selecting underachievers and the six objective methods, when 1.5 SD discrepancy or more between aptitude and performance was used as the criterion for underachievement by the objective methods.

It will be observed from Table 79 that six of the correlation coefficients between Methods 7 and 8 and Methods 1 through 6 were indeterminate for this sample. A correlation coefficient, significant at the .05 level, was found between Method 8 and Method 4. The remaining coefficients

TABLE 78

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.049	.125	.415*	.113	.519*	.452*
Method 8[h]	.301	.266	.720**	.266	.639	.301

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

TABLE 79

Tetrachoric Correlation Coefficients Among Two Subjective Methods and Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Subjective Methods of Selecting Underachievers	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Method 7[g]	.021	IND	.276	.459	IND	.373
Method 8[h]	.131	IND	IND	.539*	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Selection of underachievers by student judgment of achievement.

[h] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

between the two subjective methods of selecting underachievers and the six objective methods were non-significant at the .05 level.

Discussion. The results recorded in Tables 77, 78, and 79 for the sample of 50 students with IQ's above 110 give evidence of interrelationships between the two subjective methods of selecting underachievers and the six objective methods, when discrepancies of .5 SD or more and 1.0 SD or more between aptitude and performance were used by the objective methods as criteria for selecting underachievers. The data for a discrepancy of 1.5 SD or more, with most of the correlation coefficients indeterminate for this sample, were insufficient for drawing meaningful generalizations.

For a discrepancy of .5 SD or more, a relationship was observed between Method 7 and Methods 3 and 6. For a discrepancy of 1.0 SD, a relationship was observed between Method 8 and Methods 3, 5, and 6. Thus, at both levels of discrepancy, there appeared to be a tendency for selection of underachievers by student judgment of achievement to be related to selection of underachievers by at least one of the methods using grade point average to establish academic performance and also the one method using individual standardized test data to establish both academic aptitude and academic performance.

A relationship was observed between Method 8 and

Methods 5 and 6, when a discrepancy of .5 SD or more was used by the objective methods to select underachievers. For a discrepancy of 1.0 SD or more, there was a relationship between Method 8 and Method 3. Thus, it appears that selection of underachievers by teacher judgment of achievement tended to be related to those methods which used grade point average to establish academic performance for the smaller degree of underachievement (as defined by a discrepancy of .5 SD or more between academic aptitude and performance), but not for the greater degree of underachievement (as defined by a discrepancy of 1.0 SD or more between academic aptitude and performance).

Question 5: What Are the Interrelationships among the Five Parts of the Clinic Procedure for Selecting Underachievers, for each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 80 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when a .5 SD discrepancy or more between the Expected Ability Quotient and each factor score (see Chapter II, page 63) was used as the criterion for underachievement.

A reference to Table 80 will show that among the five parts of the clinic procedure, six of the correlation coefficients were non-significant at the .05 level, two were indeterminate for this sample, one was significant at the

TABLE 80

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	.237	.606	IND	IND
V Factor[b]		.196	.489*	.385
R Factor[c]			.266	.131
M Factor[d]				.613**
P Factor[e]				

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

.05 level, and one was significant at the .01 level.

The intercorrelations among the five parts of the clinic procedure for selecting underachievers, when a discrepancy of 1.0 SD or more was used, are summarized in Table 81.

It will be seen from Table 81 that three correlation coefficients were indeterminate for the sample under study, two were significant at the .05 level, and five were non-significant at the .05 level.

Table 82 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers when a discrepancy of 1.5 SD or more between academic aptitude and performance was used as the criterion for selecting underachievers.

It will be seen from Table 82 that all 10 of the correlation coefficients among the five parts of the clinic procedure for selecting underachievers were indeterminate for the sample under study, when a discrepancy of 1.5 SD or more between aptitude and performance was used as the criterion for selecting underachievers.

Discussion. The intercorrelations reported in Tables 80 and 81 indicate, for the sample of 50 sixth grade males with IQ's above 110, that there were interrelationships among the five parts of the clinic procedure for selecting underachievers for discrepancies of .5 SD or more and 1.0 SD

TABLE 81

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	IND	.799	.565	IND
V Factor[b]		IND	.723*	.119
R Factor[c]			.594	.639
M Factor[d]				.644*
P Factor[e]				

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

*$p < .05$.

**$p < .01$.

TABLE 82

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

The Clinic Procedure	The Clinic Procedure			
	V Factor	R Factor	M Factor	P Factor
GA Factor[a]	IND	IND	IND	IND
V Factor[b]		IND	IND	IND
R Factor[c]			IND	IND
M Factor[d]				IND
P Factor[e]				

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

$^{*}p < .05$.

$^{**}p < .01$.

or more. For a discrepancy of 1.5 SD or more between the Expected Ability Quotient and factor scores, all of the intercorrelations among the five parts of the clinic procedure were indeterminate for the sample under study.

By comparing the data for Question 5 in Analyses I, II, III, and IV at the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance, it will be seen that there were interrelationships among the five parts of the clinic procedure for each sample or Analysis at both levels of discrepancy. In view of these interrelationships among scores based on the discrepancy between the Expected Ability Quotient and factor scores, a question has been raised regarding the possibility of interrelationships among the factor scores themselves (see Analysis I, Question 5).

Question 6: What Are the Interrelationships among the Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers, at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 83 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, when a .5 SD discrepancy or more between aptitude and performance was used as the criterion for selecting underachievers.

TABLE 83

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	.119	.113	.266	.137	.106
Method 2[g]	IND	.519*	.385	.026	.144
Method 3[h]	.012	.156	.635*	.309	.353
Method 4[i]	.432	.113	.438	.274	.409
Method 5[j]	.664*	.087	.131	.336	.049
Method 6[k]	IND	.011	.389	.158	.238

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between _Lorge-Thorndike_ and _Stanford Achievement Test_.

[g] Discrepancy between WISC and _Stanford Achievement Test_.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between _Lorge-Thorndike_ and WRAT.

[j] Discrepancy between _Lorge-Thorndike_ and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

A reference to Table 83 will show that of the 30 correlation coefficients among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, 3 of the coefficients were significant at the .05 level, 25 were non-significant at the .05 level, and 2 were indeterminate for the sample under study. The correlation coefficients significant at the .05 level were found between the General Ability Factor and Method 5, the Verbal Factor and Method 2, and the Reality Factor and Method 3. None of the correlation coefficients between the Motivational or Psychomotor Factors and Methods 1 through 6 were significant at the .05 level.

Table 84 summarizes the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers, when a discrepancy of 1.0 SD or more between academic aptitude and performance was used as a criterion for selecting underachievers.

It will be noted from Table 84 that of the 30 intercorrelations among the five parts of the clinic procedure and the six objective methods of selecting underachievers, 12 of the correlation coefficients were indeterminate for the sample under study, 16 were non-significant at the .05 level, and 2 were significant at the .05 level.

Table 85 summarizes the intercorrelations among the five parts of the clinic procedure for selecting

TABLE 84

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	IND	.322	IND	.048	.344
Method 2[g]	IND	.524	.239	.468	.718*
Method 3[h]	.301	.152	.145	.450	.547*
Method 4[i]	IND	.119	IND	.198	.131
Method 5[j]	IND	IND	IND	IND	IND
Method 6[k]	IND	.322	IND	.048	.518

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between Lorge-Thorndike and *Stanford Achievement Test*.

[g] Discrepancy between WISC and *Stanford Achievement Test*.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between Lorge-Thorndike and WRAT.

[j] Discrepancy between Lorge-Thorndike and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

TABLE 85

Tetrachoric Correlation Coefficients Among Five Parts of the Clinic Procedure for Selecting Underachievers and the Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Objective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 1[f]	IND	IND	IND	IND	IND
Method 2[g]	IND	IND	IND	IND	---
Method 3[h]	IND	IND	IND	IND	IND
Method 4[i]	IND	IND	IND	IND	IND
Method 5[j]	IND	IND	IND	IND	IND
Method 6[k]	IND	IND	IND	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[g] Discrepancy between WISC and *Stanford Achievement Test*.

[h] Discrepancy between WISC and WRAT.

[i] Discrepancy between *Lorge-Thorndike* and WRAT.

[j] Discrepancy between *Lorge-Thorndike* and GPA.

[k] Discrepancy between WISC and GPA.

*$p < .05$.

**$p < .01$.

underachievers and the six objective methods of selecting underachievers, when a discrepancy of 1.5 SD or more was used as the criterion for selecting underachievers.

A reference to Table 85 will show that all 30 of the correlation coefficients between the five parts of the clinic procedure and the six objective methods of selecting underachievers were indeterminate for the sample under study.

Discussion. The results reported for the .5 SD and 1.0 SD levels of discrepancy between academic aptitude and performance show evidence of only a few interrelationships, at each of these levels, among the five parts of the clinic procedure and the six objective methods of selecting underachievers for the sample under study. For a discrepancy of 1.5 SD or more, all of the correlation coefficients between the clinic procedure and objective methods were indeterminate for the sample of 50 sixth grade boys with IQ's above 110.

When a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for underachievement, relationships were found between the General Ability Factor and Method 5, the Verbal Factor and Method 2, and the Reality Factor and Method 3. The data did not show evidence of any relationships between either the Motivational or Psychomotor Factors and the six objective methods of selecting underachievers.

At the 1.0 SD level of discrepancy, relationships were observed between the Motivational Factor and Method 3 and also between the Psychomotor Factor and Methods 2 and 3. The data for a discrepancy of 1.0 SD or more between aptitude and performance may be considered insufficient for making meaningful generalizations because of the relatively large number of correlation coefficients which were indeterminate for this sample.

On the basis of the data obtained in the previous three analyses, a question has been raised regarding the overall usefulness of the clinic procedure as a means of selecting underachievers. It was also pointed out that the factor discrepancy scores may deal with different aspects of underachievement than the objective methods of selecting underachievers.

The relative lack of interrelationships among selection of underachievers by the clinic procedure and the objective methods of selecting underachievers, for the present sample, supports the questions raised in the preceding paragraph. It will be noted, however, that in all four samples, the Motivational Factor was related to at least one of the objective methods of selecting underachievers at the .5 SD and 1.0 SD levels of discrepancy between aptitude and performance.

Question 7: What Are the Interrelationships among the Five Parts of the Clinic Procedure and the Two Subjective Methods of Selecting Underachievers at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 86 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers when a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

It will be noted from Table 86 that all 10 of the intercorrelations between the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers were non-significant at the .05 level.

Table 87 records the results for the intercorrelations among the five parts of the clinic procedure for selecting underachievers and the two subjective methods of selecting underachievers, when a discrepancy of 1.0 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

A reference to Table 87 will show that all of the correlation coefficients between Method 7 and the five parts of the clinic procedure were non-significant at the .05 level. Of the correlation coefficients between Method 8

TABLE 86

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	.373	.211	.131	.027	.188
Method 8[g]	.282	.092	.000	.000	.127

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

TABLE 87

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	.098	.276	.349	.009	.339
Method 8[g]	.000	.539	.000	.106	.470

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

and the five parts of the clinic procedure, three were nonsignificant at the .05 level and two were significant at the .05 level. The significant correlation coefficients were between Method 8 and the Verbal and Psychomotor Factors.

Table 88 records the results for the intercorrelations among the five parts of the clinic procedure and the two subjective methods of selecting underachievers, when a discrepancy of 1.5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure.

A reference to Table 88 will show that when a discrepancy of 1.5 SD or more was used, all 10 of the correlation coefficients between the two subjective methods and the five parts of the clinic procedure were indeterminate for this sample.

Discussion. The results reported in Tables 86, 87, and 88 show evidence of only two relationships among the five parts of the clinic procedure and the two subjective methods of selecting underachievers for the sample of 50 sixth grade males with IQ's above 110.

When a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the clinic procedure, the findings did not show evidence of a relationship between selection of underachievers by either teacher or student judgment of

TABLE 88

Tetrachoric Correlation Coefficients Among the Two Subjective Methods of Selecting Underachievers and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Academic Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Subjective Methods of Selecting Underachievers	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Method 7[f]	IND	IND	IND	IND	IND
Method 8[g]	IND	IND	IND	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Selection of underachievers by student judgment of achievement.

[g] Selection of underachievers by teacher judgment of achievement.

*$p < .05$.

**$p < .01$.

achievement and any of the five parts of the clinic procedure for selecting underachievers.

When a discrepancy of 1.0 SD or more was used, a relationship was not observed between selection of underachievers by student judgment of achievement and any of the five parts of the clinic procedure. There was a relationship, however, between selection as an underachiever by teacher judgment of achievement and the Verbal and Psychomotor Factors.

For a discrepancy of 1.5 SD or more, all of the intercorrelations between the five parts of the clinic procedure and the two subjective methods of selecting underachievers were indeterminate for the sample under study.

Question 8: What Is the Relationship between the Two Measures of Self-Perception?

A correlation coefficient of .150, which was nonsignificant at the .05 level, was obtained between the two measures of self-perception, *i.e.* student academic self-concept and student perception of control over environment. (Level of discrepancy between academic aptitude and academic performance was not involved in the comparison between the two measures of self-perception.)

Discussion. These results indicate that there was not a relationship between student academic self-concept and negative perception of control over environment for the sample of 50 sixth grade males with IQ's above 110.

It will be recalled from Analyses I, II, and III that a relationship was found between the two measures of self-perception for the random sample of 100 students and the sample of 50 students with IQ's below 90, and also for the sample of 50 students with IQ's from 90 through 110.

Question 9: What Are the Interrelationships among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 89 records the results for the intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a .5 SD discrepancy or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

It will be seen from Table 89 that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 10 of the correlation coefficients were non-significant at the .05 level, one was indeterminate for this sample and one was significant at the .05 level. The significant correlation coefficient was between Variable B and Method 4.

Table 90 records the results for the intercorrelations among the two measures of self-perception and the six

TABLE 89

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.054	.289	.122	.054	.187	.341
Variable B[h]	.409	.305	IND	.613*	.025	.409

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between *Lorge-Thorndike* and *Stanford Achievement Test*.

[b] Discrepancy between WISC and *Stanford Achievement Test*.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between *Lorge-Thorndike* and WRAT.

[e] Discrepancy between *Lorge-Thorndike* and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

* $p < .05$.

** $p < .01$.

TABLE 90

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method[a] 1	Method[b] 2	Method[c] 3	Method[d] 4	Method[e] 5	Method[f] 6
Variable A[g]	.187	.150	.580**	.343	.137	.332
Variable B[h]	.301	.266	.720**	.266	.639	.301

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Sudent academic self-concept.

[h] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

objective methods of selecting underachievers, when a discrepancy of 1.0 SD or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

A reference to Table 90 will show that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, 10 of the correlation coefficients were non-significant at the .05 level and two were significant at the .01 level. The significant correlation coefficients were between Method 3 and Variables A and B.

Table 91 records the results for the intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, when a discrepancy of 1.5 SD or more between aptitude and performance was used by each of the objective methods as the criterion for selecting underachievers.

It will be observed from Table 91 that of the 12 intercorrelations among the two measures of self-perception and the six objective methods of selecting underachievers, seven of the correlation coefficients were non-significant at the .05 level, four of the coefficients were indeterminate for the sample under study, and one coefficient was significant at the .05 level. The significant correlation coefficient was between Variable A and Method 3.

TABLE 91

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Six Objective Methods of Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Measures of Self-Perception	Objective Methods of Selecting Underachievers					
	Method^{a} 1	Method^{b} 2	Method^{c} 3	Method^{d} 4	Method^{e} 5	Method^{f} 6
Variable A^{g}	.262	IND	.637*	.430	IND	.153
Variable B^{h}	.342	IND	.119	.119	IND	.392

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Lorge-Thorndike and Stanford Achievement Test.

[b] Discrepancy between WISC and Stanford Achievement Test.

[c] Discrepancy between WISC and WRAT.

[d] Discrepancy between Lorge-Thorndike and WRAT.

[e] Discrepancy between Lorge-Thorndike and GPA.

[f] Discrepancy between WISC and GPA.

[g] Student academic self-concept.

[h] Student perception of control over environment.

$^{*}p < .05$.

$^{**}p < .01$.

Discussion. For the sample of 50 sixth grade males with IQ's above 110, the data for Variable A show a striking lack of relationships between negative self-concept and academic underachievement (operationally defined by six objective methods of selecting underachievers based on the relative discrepancy between aptitude and performance). For a discrepancy of .5 SD or more between aptitude and performance, the results indicated no relationships between negative self-concept and the objective methods of selecting underachievers. At the 1.0 SD and 1.5 SD levels of discrepancy, a relationship was observed between negative self-concept and Method 3. A reference to the discussion of Question 9 for Analyses I, II, and III will show a similar lack of relationships between negative self-concept and the six objective methods of selecting underachievers for the random sample of 100 students, the sample of 50 students with IQ's below 90, and the sample of 50 students with IQ's above 110. It was previously pointed out in the discussion of Question 9, Analysis I that the findings of the present investigation may have been influenced by the manner in which scores representing negative self-concept were obtained.

The data for Variable B also indicate very few relationships between negative perception of control over environment and academic underachievement (operationally defined by six objective methods of selecting underachievers based on the relative discrepancy between aptitude and performance. For a discrepancy of .5 SD or more, a relationship was found between negative perception of control over environment and Method 4. A relationship was found between negative perception of control over environment and Method 3 for a discrepancy of 1.0 SD or more. With two of the six coefficients indeterminate for this sample at the 1.5 SD discrepancy level, the data were insufficient for drawing meaningful generalizations. On the whole, students in this sample agreeing with or not sure about the statement "People like me don't have much of a chance to be successful in life" were not generally selected as underachievers by the six objective methods.

Question 10: What Are the Interrelationships among the Two Measures of Self-Perception and the Two Subjective Methods of Selecting Underachievers?

Table 92 gives the intercorrelations among the two measures of self-perception and the two subjective methods of selecting underachievers. (Level of discrepancy between aptitude and performance was not involved in these comparisons).

It will be seen from Table 92 that all four of the correlation coefficients among the two measures of self-perception and the two subjective methods of selecting underachievers were non-significant at the .05 level.

Discussion. These results indicated no relationships

TABLE 92

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Two Subjective Methods of Selecting Underachievers for a Sample of 50 Sixth Grade Males with IQ's Above 110

Measures of Self-Perception	Subjective Methods of Selecting Underachievers	
	Method 7[a]	Method 8[b]
Variable A[c]	.351	.064
Variable B[d]	.113	.234

[a] Selection of underachievers by student judgment of achievement.

[b] Selection of underachievers by teacher judgment of achievement.

[c] Student academic self-concept.

[d] Student perception of control over environment.

*$p < .05$

**$p < .01$.

between negative self-concept and selection of underachievers by student judgment of achievement or teacher judgment of achievement. They also indicated no relationship between negative perception of control over environment and selection of underachievers by student judgment of achievement or teacher judgment of achievement. Thus, for the sample of 50 students with IQ's above 110, students with negative self-concepts or negative perception of control over environment tended not to select tnemselves as underachievers or to be selected by their teachers as underachievers.

In comparing this lack of interrelationships with those of Analyses I through IV, it will be noted that a relationship was found between Method 7 and Variables A and B for the random sample of 100 students; a relationship was found between Method 7 and Variable B for the sample of 50 students with IQ's from 90 through 110. The results indicated no interrelationships, however, between Variables A and B and Methods 7 and 8 for the sample of 50 students with IQ's below 90.

Question 11: What Are the Interrelationships among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers, for Each of Three Levels of Discrepancy between Measures of Academic Aptitude and Academic Performance?

Table 93 summarizes the intercorrelations between the two measures os self-perception and the five parts of the

TABLE 93

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at .5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	.153	.251	.468*	.189	.162
Variable B[g]	IND	.079	IND	.189	.125

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

clinic procedure for selecting underachievers, when a discrepancy of .5 SD or more between aptitude and performance was used as the criterion for selecting underachievers by the five parts of the clinic procedure.

It will be seen from Table 93 that of the 10 correlation coefficients between the two measures of self-perception and the five parts of the clinic procedure, 2 were indeterminate for this sample, 7 were non-significant at the .05 level, and 1 was significant at the .05 level. The significant correlation coefficient was between Variable A and the Reality Factor.

Table 94 summarizes the intercorrelations among the two measures of self-perception and the five parts of the clinic procedure when a discrepancy of 1.0 SD or more between aptitude and performance was used by the clinic procedure as the criterion for selecting underachievers.

It will be observed from Table 94 that of the 10 intercorrelations among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, 2 of the correlation coefficients were indeterminate for the sample under study and 8 correlation coefficients were non-significant at the .05 level.

Table 95 summarizes the intercorrelations among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, when a discrepancy of 1.5 SD or more was used by the clinic

TABLE 94

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.0 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	.131	.309	.137	.174	.374
Variable B[g]	IND	.119	IND	.198	.131

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

*$p < .05$.

**$p < .01$.

TABLE 95

Tetrachoric Correlation Coefficients Among the Two Measures of Self-Perception and the Five Parts of the Clinic Procedure for Selecting Underachievers at 1.5 SD Discrepancy Between Academic Aptitude and Performance for a Sample of 50 Sixth Grade Males with IQ's Above 110

Measures of Self-Perception	The Clinic Procedure for Selecting Underachievers				
	GA[a] Factor	V[b] Factor	R[c] Factor	M[d] Factor	P[e] Factor
Variable A[f]	IND	IND	IND	IND	IND
Variable B[g]	IND	IND	IND	IND	IND

Note.--IND: Indeterminate correlation coefficient for this sample.

[a] Discrepancy between Expected Ability Quotient and General Ability Factor.

[b] Discrepancy between Expected Ability Quotient and Verbal Factor.

[c] Discrepancy between Expected Ability Quotient and Reality Factor.

[d] Discrepancy between Expected Ability Quotient and Motivational Factor.

[e] Discrepancy between Expected Ability Quotient and Psychomotor Factor.

[f] Student academic self-concept.

[g] Student perception of control over environment.

$^{*}p < .05$.

$^{**}p < .01$.

procedure as the criterion for selecting underachievers.

It will be noted from Table 95, for a discrepancy of 1.5 SD, that all 10 of the intercorrelations among the two measures of self-perception and the five parts of the clinic procedure were indeterminate for this sample.

Discussion. The results at a discrepancy of .5 SD or more indicated a relationship between the Reality Factor and Variable A. No other relationships were indicated by the data from all three levels of discrepancy between aptitude and performance.

CHAPTER IV

SUMMARY, MAJOR FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The identification of underachieving students has long been a special problem for educators. Various investigators have addressed themselves, theoretically and experimentally, with little agreement among them, to the identification of underachieving students. The problem with which the present investigation was concerned was the general inconsistency of the findings in the literature on underachievement and the diversity among methods of selecting underachievers (or, operational definitions of underachievement).

The purpose of the present study was to investigate the interrelationships among various methods of selecting underachievers which could all be classified within the same category of operational definitions of underachievement. Thus, all methods of selecting underachievers used in the present investigation were based on [illegible] category of operational definitions called, in the Farquhar and Payne (1964) classification of definitions, "relative discrepancy split," *i.e.*, the relative discrepancy in standard score units between some measure of academic aptitude and some measure of academic performance. Because of the possibility that the individual psychological characteristics of both teacher and child may influence scholastic underachievement, additional comparisons were made using two variables frequently associated with underachievement.

Methods 1 through 6, which were based on the discrepancy between academic aptitude and standardized test data or teacher grades, were considered objective methods of selecting underachievers. Methods 7 and 8, which were based on the discrepancy between academic aptitude and teacher judgment or student judgment of achievement, were considered subjective methods of selecting underachievers. Method 9, which was composed of five separate parts, was a clinic procedure for selecting underachievers. Variables A and B were considered measures of self-perception.

The specific methods of selecting underachievers and the variables chosen for study were as follows: (a) *Method 1*: Selection of underachievers by discrepancy between a standardized *group* measure of academic aptitude and a standardized *group* measure of academic performance, (b) *Method 2*: Selection of underachievers by discrepancy between a standardized *individual* measure of academic aptitude and a standardized *group* measure of academic performance, (c) *Method 3*: Selection of underachievers by discrepancy between a standardized *individual* measure of academic aptitude and a standardized *individual* measure of academic performance, (d) *Method 4*: Selection of underachievers by discrepancy between a standardized *group* measure of academic aptitude and a standardized *individual* measure of academic performance, (e) *Method 5*: Selection of underachievers by discrepancy between a standardized *group* measure of academic aptitude and *teacher grades*, (f) *Method 6*: Selection of underachievers by discrepancy between a standardized *individual* measure of academic aptitude and *teacher grades*, (g) *Method 7*: Selection of underachievers by *student judgment of achievement*, (h) *Method 8*: Selection of underachievers by *teacher judgment of achievement*, and (i) *Method 9*: Selection of underachievers by the *clinic procedure*. The clinic procedure is based on the adapted Jastak procedure and includes the following five factors: General Ability, Verbal, Reality, Motivational, Psychomotor (see Chapter II, pages 61, 62, and 63), (j) *Variable A*: Student academic self-concept, and (k) *Variable B*: Student perception of control over environment.

Standardized instruments used in this study to measure academic aptitude were the *Lorge-Thorndike Intelligence Tests* and the *Wechsler Intelligence Scale for Children.* Standardized measures of academic performance used in this study were the *Stanford Achievement Test* and the *Wide Range Achievement Test*. In addition to the standardized measures of academic aptitude and performance, unstandardized measures were used to obtain data for the two subjective methods of selecting underachievers and the two measures of self-perception.

The subjects for the study were selected from the entire white male sixth grade population of a large Southern school system. Since it is possible that level of intelligence may influence comparisons among methods of selecting underachievers, a separate analysis was made for each of four samples of students: (a) Analysis I: random sample of 100 students, (b) Analysis II: sample of 50 students with IQ's below 90, (c) Analysis III: sample of 50 students with IQ's from 90 through 110, and (d) Analysis IV: sample of 50 students with IQ's above 110.

The following specific questions were asked for each of the four samples:

1. Is the probability of selection as an underachiever equally distributed across six objective methods of selecting underachievers, two subjective methods of selecting underachievers, and a five-part clinic procedure for selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

2. What are the interrelationships among the six objective methods of selecting underachievers, for each of three levels of discrepancy between measures of academic

aptitude and academic performance?

3. What is the relationship between the two subjective methods of selecting underachievers?

4. What are the interrelationships among the two subjective methods of selecting underachievers and the six objective methods of selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

5. What are the interrelationships among the five parts of the clinic procedure for selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

6. What are the interrelationships among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers at each of three levels of discrepancy between measures of academic aptitude and academic performance?

7. What are the interrelationships among the five parts of the clinic procedure and the two subjective methods of selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

8. What is the relationship between the two measures of self-perception?

9. What are the interrelationships among the two

measures of self-perception and the six objective methods of selecting underachievers, for each of three levels of discrepancy between measures of academic aptitude and academic performance?

10. What are the interrelationships among the two measures of self-perception and the two subjective methods of selecting underachievers?

11. What are the interrelationships among the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers, at each of three levels of discrepancy between measures of academic aptitude and academic performance.

Summary of Major Findings and Their Implications

From the data gathered and analyzed in this investigation, the interrelationships which are considered of primary importance for the four separate analyses will be synthesized for each of the specific questions.

Question 1

The data for all four samples indicated that selection as an underachiever was not equally probable among the six objective methods of selecting underachievers, the two subjective methods, and the five-part clinic procedure for selecting underachievers at each of three levels of discrepancy between aptitude and performance.

Question 2

The data for the interrelationships among the six objective methods of selecting underachievers gave evidence of a definite trend in the relationships for the random sample of 100 students. For a discrepancy of .5 SD or more between academic aptitude and performance, a relationship was observed between two methods of selecting underachievers whenever two methods used either the same measures of academic aptitude or the same measure of academic performance. For a discrepancy of 1.0 SD or more, the data indicated a relationship between two methods of selecting underachievers when the two methods used the same measure of academic aptitude. The findings, in general, did not support the frequently held assumption that a relationship exists between methods of selecting underachievers which employ the same criterion of academic performance. For all four samples, the findings for a discrepancy of 1.5 SD or more between aptitude and performance, with many of the correlation coefficients indeterminate for these samples, were insufficient for drawing meaningful generalizations.

Of the three samples classified according to level of intelligence, the data for the sample with IQ's from 90 through 110 showed the most frequent evidence of the pattern of interrelationships described in the preceding paragraph. Some evidence of the trend was observed, however, from the data for the sample with IQ's below 90 and the sample with

IQ's above 110. The lack of clear-cut relationships and the increased number of indeterminate correlation coefficients for Analyses II, III and IV may be attributed to the restricted range of the sample's size of 50 as compared with the sample size of 100.

Question 3

The data for the random sample and the sample with IQ's above 110 indicated that there was a relationship between the two subjective methods of selecting underachievers, *i.e.*, student judgment of achievement and teacher judgment of achievement. A relationship was not indicated by the results from the sample with IQ's below 90 or the sample with IQ's from 90 through 110. A possible interpretation of these findings would be that the more intelligent students may be more perceptive about their teachers' judgment of their achievement.

Question 4

The findings indicated two somewhat ambiguous trends among the interrelationships between the two subjective methods of selecting underachievers and the six objective methods.

Firstly, a lack of interrelationships between selection as an underachiever by student judgment of achievement and the six objective methods of selecting underachievers was noted from the data for the following samples: (a) random sample, for a discrepancy of 1.0 SD or more between aptitude and performance, (b) sample with IQ's below 90, for a discrepancy of 1.5 SD or more, (c) sample with IQ's from 90 through 110, for discrepancies of .5 SD or more and 1.0 SD or more. A relationship between selection as an underachiever by student judgment of achievement and at least two of the objective methods of selecting underachievers was noted, however, from the data for the sample with IQ's above 110 at discrepancies of .5 SD or more and 1.0 SD or more.

Secondly, it was observed from the data for the random sample that there was a relationship between selection as an underachiever both by teacher judgment and student judgment of achievement and the two methods of selecting underachievers which used grade point average to establish academic performance (when a discrepancy of .5 SD or more between aptitude and performance was used by the latter as the criterion for underachievement). A relationship was also observed between selection as an underachiever by teacher judgment of achievement and the two methods using grade point average for the sample with IQ's above 110, for a discrepancy of .5 SD or more.

For all four samples, when a discrepancy of 1.5 SD or more was used by the objective methods as the criterion for selecting underachievers, many of the coefficients were unobtainable and the data were considered insufficient for drawing meaningful generalizations.

Question 5

The data for all four samples indicated that there were interrelationships among the five parts of the clinic procedure for selecting underachievers, for discrepancies of .5 SD or more and 1.0 SD or more between academic aptitude and academic performance. Subsidiary data indicated, for the random sample, that there were interrelationships among the five factor scores on which the five parts of the clinic procedure were based. These findings would raise a question about the statistical independence of the adapted Jastak factors.

Question 6

The data for all four samples show evidence of only a few interrelationships among the five parts of the clinic procedure for selecting underachievers and the six objective methods of selecting underachievers at the .5 SD and 1.0 SD discrepancy levels. For all four samples, with the majority of the correlation coefficients indeterminate, the data at a discrepancy of 1.5 SD or more were insufficient for drawing meaningful generalizations. A question was raised regarding the overall usefulness of the clinic procedure as a method of selecting underachievers. It was also pointed out that the clinic procedure may deal with different dimensions of underachievement than the objective methods of selecting underachievers.

It was noted, however, that in all four samples, there was a relationship between the Motivational Factor and at least one of the objective methods of selecting underachievers, for discrepancies of .5 SD or more and 1.0 SD or more between aptitude and performance.

Question 7

The data for all four samples gave evidence of very few interrelationships between the two subjective methods of selecting underachievers and the five parts of the clinic procedure, when discrepancies of .5 SD or more and 1.0 SD or more between aptitude and performance were used by the clinic procedure as criteria for selecting underachievers. For the random sample and the sample with IQ's from 90 through 110, when a discrepancy of 1.0 SD or more was used, the data indicated a relationship between selection as an underachiever by teacher judgment of achievement and selection by the Motivational and Psychomotor Factors. For a discrepancy of 1.5 SD or more, with the majority of the intercorrelations indeterminate for the four samples, the data were insufficient for drawing meaningful generalizations.

Question 8

The results of the investigation indicated that there was a relationship between the two measures of self-perception for the random sample, the sample with IQ's below 90, the sample with IQ's from 90 through 110, but not for the sample with IQ's above 110.

Question 9

The data for all four samples gave evidence of very few relationships between negative self-concept and the six objective methods of selecting underachievers for discrepancies of .5 SD or more and 1.0 SD or more between aptitude and performance. Since a relationship between negative self-concept and academic underachievement among males has been fairly well established by various investigators (Lavin, 1965), the findings of the present investigation would seem to have some implications relevant to the way in which the scores representing negative self-concept were obtained on the Self-Concept Q-Sort. A possibility exists that the median split, which was used in this study, may not discriminate between students who have negative self-concept and those who do not.

The data for all four samples also indicated very few relationships between negative perception of control over environment and the six objective methods of selecting underachievers for discrepancies of .5 SD or more and 1.0 SD or more between aptitude and performance.

The data for a discrepancy of 1.5 SD or more, with the majority of the correlation coefficients indeterminate for these four samples, were insufficient for drawing meaningful generalizations.

Question 10

The results of the interrelationships between the two subjective methods of selecting underachievers and the two measures of self-perception showed a relationship between selection as an underachiever by student judgment of achievement and both measures of self-perception for the random sample. A relationship was also observed between selection as an underachiever by student judgment of achievement and negative perception of control over environment from the data for the sample with IQ's from 90 through 110.

For the sample with IQ's below 90 and the sample with IQ's above 110, the data indicated no relationships between the two subjective methods of selecting underachievers and the two measures of self-perception.

The implications of these findings are not clear. However, these results do give evidence that the individual psychological characteristics of both teacher and child have some influence on perception of scholastic underachievement.

Question 11

The results for the intercorrelations between the two measures of self-perception and the five parts of the clinic procedure for selecting underachievers gave evidence of interrelationships at the 1.0 SD discrepancy level. For all four samples, the correlation coefficients at a discrepancy of .5 SD or more were predominantly non-significant at the

.05 level and at a discrepancy of 1.5 SD or more were predominantly indeterminate.

Conclusions

The primary conclusion drawn from the present investigation is that even within a single classification of operational definitions of underachievement, selection as an underachiever is not equally probable for methods using different measures or criteria to establish academic aptitude and academic performance.

It should be noted, however, that this study was specifically designed as an exploratory investigation. As such it lacks the precision of design suitable to systematic, well-controlled experimentation. The exploratory nature of the study should impose strict limitations on the generalization of these data. Specifically, the large number of correlation coefficients which were computed increases the likelihood that more correlation coefficients could attain statistical significance on the basis of chance fluctuation. A total of 1,192 tetrachoric correlation coefficients were computed.

Thus it is suggested that the principal findings of this study are most appropriate for delineating problem areas to be investigated more systematically.

Recommendations

A number of problem areas suggested by the findings of this study have implications for further research in the elementary grades:

1. The present study explored interrelationships among selected relative discrepancy methods of selecting underachievers. The exploratory purpose of the present study could be extended by using the data obtained in the present investigation for the random sample of 100 sixth grade males to explore the interrelationships among selected relative discrepancy methods of selecting overachievers.

2. The tendency for methods of selecting underachievers to be related when they employ the same measure of intelligence suggests that further attention needs to be directed to the role of group versus individual intelligence tests in operational definitions of underachievement.

The present investigation used only one classification of methods of selecting underachievers, *i.e.*, the relative discrepancy in standard scores between measures of academic aptitude and academic performance. Fraquhar and Payne (1964) in a previously mentioned classification of methods of selecting underachievers noted four major classes of definitions in the literature on underachievement: central tendency splits, arbitrary partitions-middle group eliminated, relative discrepancy splits, regression model selection.

It is possible that the use of relative discrepancy methods of selecting underachievers in the study may have had some influence on the tendency for methods of selecting underachievers to be related to other methods using the same measure of academic aptitude. It would be desirable to investigate this finding for each of the other three classes of operational definitions of underachievement named by Farquhar and Payne (1964).

It is also possible that the choice of the particular instruments used to measure academic aptitude may have had some bearing on the tendency for agreement among methods of selecting underachievers using the same measure of intelligence. Thus, interrelationships among methods of selecting underachievers should be investigated using group and individual measures of academic aptitude different from those used in the present study.

3. The findings pertaining to the five parts of the adapted Jastak procedure suggest the need for investigation of the validity of the factors. Discrepancy from an expected level of ability in Verbal, Motivational, Reality, and Psychomotor ability did not tend to be related to the other operational definitions of underachievement or to the personality variables used in this study. Clinical use of these factor discrepancy scores as indicators of deficit would require establishing the validity of each. For example,

Verbal ability scores might be correlated with scores on the verbal section of intelligence tests, reading tests and the like.

On the basis of the interrelated discrepancy scores obtained by using the factor scores and the Expected Ability Quotient and the interrelated factor scores (random sample of 100 students), it is suggested that the techniques by which these factors were obtained need to be subjected to further study.

4. The instruments used to obtain the data concerning the relationships of each of two measures of self-perception and the two subjective methods of selecting underachievers were informal and subjective. The findings indicate, however, several general research questions which could be further explored (with regard to level of intelligence) by using more fully developed instrumentation:

a. Do students and/or teachers estimate accurately a student's academic potential?

b. Do students and/or teachers judge a student's academic performance against a criterion other than academic potential: (_e_._g_., the relative performance of other students, or teacher perception of students' basic personal adjustment).

c. Do students with lower IQ's expect higher academic performance of themselves than their teachers expect of them?

d. Do brighter students' expectations for their academic performance coincide more closely with the expectations of their teachers than average and below average students?

e. Do teachers expect less in the way of academic performance from students with negative self-concepts and/or negative perception of control over environment?

f. Is there a relationship between student self-concept and teacher perception of student self-concept?

5. The findings for Variable A, negative student self-concept, suggested that the use of a median split to obtain scores representing negative self-concept may not be appropriate on the Self-Concept Q-Sort. Further investigation is needed.

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APPENDIX

APPENDIX

INSTRUMENTS

Self-Concept Q-Sort--Virginia Bennett[1]

Form 1

Things don't usually bother me.
I'm really dumb.
I am usually a sad person.
Others know they can trust me.
It makes me feel good to be praised when I've done something well.
It bothers me when I think others are talking about me.
I don't try as hard as I should.
I am usually a happy person.
I usually go along with what others want or say even if I'm not sure they're right.
I never give up until I've really tried as hard as I can.
I'm really pretty smart.
I'm sorry when our team is losing, but I keep right on rooting for them.
I'm good at most things I try to do.
I don't think others can trust me.
I often think I'm really no good.
I'll grow up to be somebody good.
Even when people tell me I've done something well, I'm not sure I have, myself.
No matter what I try, I don't seem to be much good at it.
I make a good leader or captain.
I don't care what others say about me as long as I know I'm doing the right thing.
It seems somebody is always pushing me around.
Others can't talk me out of it once I know I'm right.
I hate to try real hard because I get mixed up.
I usually know why I do things.
I don't have many good friends.
I'm a real worrier.

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[1] V. D. C. Bennett, "Development of Self-Concept Q-Sort for Use with Elementary Age Children," Journal of School Psychology, III (1964), 22.

Form 2

I can't do anything right.
If I could make myself over, I'd be completely different.
I can take it OK if my team loses.
Others don't choose me to be on their side because I'm not much good at anything.
I am pretty much content with the way I am.
I can take things as they come.
I think others really don't like me very much.
I just don't really like myself.
I can go ahead and do things without worrying about what somebody else is going to say about me.
I have a right to be proud of myself.
I am a person others can count on.
It seems to me I always have something to worry about.
I know inside myself I'm really a good person.
When I know I'm right, I stick to it.
I can't do well in school because I'm not smart enough.
If I do something, I have a good reason for it.
I often feel ashamed.
Other kids are always picking on me or teasing me.
I usually get picked by others to be on their side because I'm pretty good at most things.
Others can't count on me because I don't always come through.
I worry a lot about what others might say about me.
I can do good work in school because I've got the brains.
I can keep at things until they get done.
I give up too easily.
I can be the one who starts things and gets them going.
I give in to other people easily.